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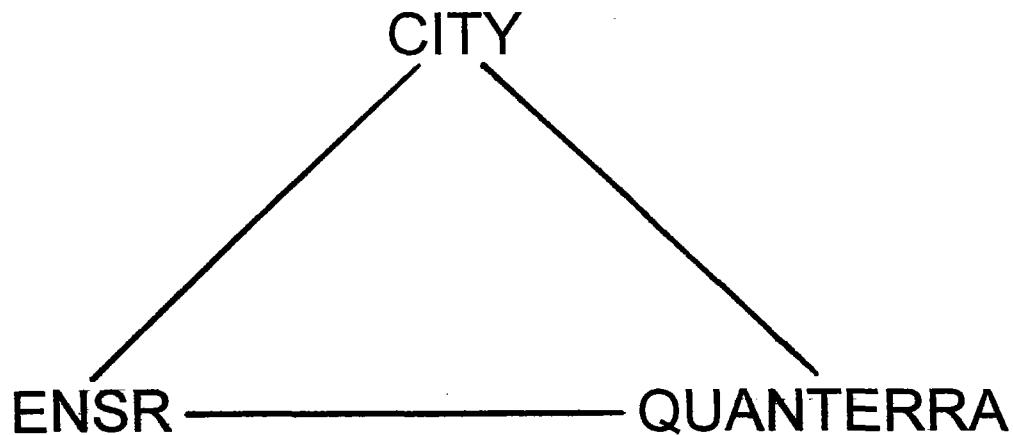
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ANNUAL MONITORING REPORT  
FOR 1996

REILLY TAR & CHEMICAL CORP.  
N.P.L. SITE  
ST. LOUIS PARK, MINNESOTA

part A

SUBMITTED MARCH 15, 1997





**CITY OF  
ST. LOUIS  
PARK**

**UTILITY OPERATIONS**

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

March 15, 1997

Regional Administrator  
United States Environmental  
Protection Agency, Region 5  
ATTN: Darryl Owens  
Mail Code 5-HS-11  
230 S. Dearborn Street  
Chicago, Illinois 60604

Director, Solid and Hazardous  
Waste Division  
Minnesota Pollution Control Agency  
ATTN: Site Response Section  
520 Lafayette Road North  
ST. Paul, Minnesota 55155

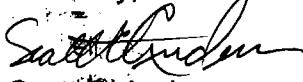
President  
Reilly Industries, Inc.  
1510 Market Square Center  
151 North Delaware  
Indianapolis, Indiana 46204

RE: United States of America, et al. vs Reilly Tar &  
Chemical Corporation, et al.  
File No. Civ. 4-80-469  
CD-RAP Section 3.4

Gentleman:

Enclosed is the 1996 annual monitoring report submitted pursuant to Section 3.4 of the consent Decree-Remedial Action Plan in the above captioned matter. This report is issued by the City in accordance with Section 2 (a) of the Reilly/St. Louis Park Agreement (Exhibit B to the Consent Decree).

Sincerely,

  
Scott E. Anderson  
Superintendent of Utilities

enclosure  
SEA/pmm

cc: William Gregg (w2 enclosures)  
Gary Fuchs (w/o enclosures)  
Reilly File  
RAP/annmonit

**ANNUAL MONITORING REPORT**

**FOR 1996**

**SUBMITTED TO THE**

**REGIONAL ADMINISTRATOR  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION V**

**EXECUTIVE DIRECTOR  
MINNESOTA POLLUTION CONTROL AGENCY**

**BY**

**THE CITY OF ST. LOUIS PARK**

**PURSUANT TO  
CONSENT DECREE - REMEDIAL ACTION PLAN  
SECTION 3.4**

**UNITED STATES OF AMERICA, ET AL.**

**VS.**

**REILLY TAR AND CHEMICAL CORPORATION, ET AL.**

**UNITED STATES DISTRICT COURT  
DISTRICT OF MINNESOTA  
CIVIL NO. 4-80-469**

**MARCH 15, 1997**

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## 1.0 INTRODUCTION

Pursuant to Section 3.4 of the Consent Decree - Remedial Action Plan (CD-RAP) in the case of the United States of America, *et al.* vs. Reilly Tar & Chemical Corporation, *et al.*, this report presents the results of all chemical analyses and water level measurements for calendar year 1996 that are not presented in previous reports.

The ground water monitoring conducted in 1996 was performed in accordance with the Sampling Plan submitted in October 1995. The City of St. Louis Park (City) has overall responsibility for conducting the ground water monitoring required by the CD-RAP. In accordance with the Sampling Plan, the City was assisted in 1996 by ENSR who collected ground water samples from monitoring wells, and by Quanterra Environmental Services (Quanterra) who performed the analyses for PAH and phenolics.

The 1996 monitoring data are presented separately for each aquifer that was monitored, starting with the Mt. Simon-Hinckley Aquifer, which is the deepest below the ground surface, and ending with the Drift Aquifer, which is the uppermost aquifer monitored. A series of maps has been prepared to help present the monitoring data. Maps for the Prairie du Chien-Jordan, St. Peter, and Platteville Aquifers are contained in the pockets of this report.

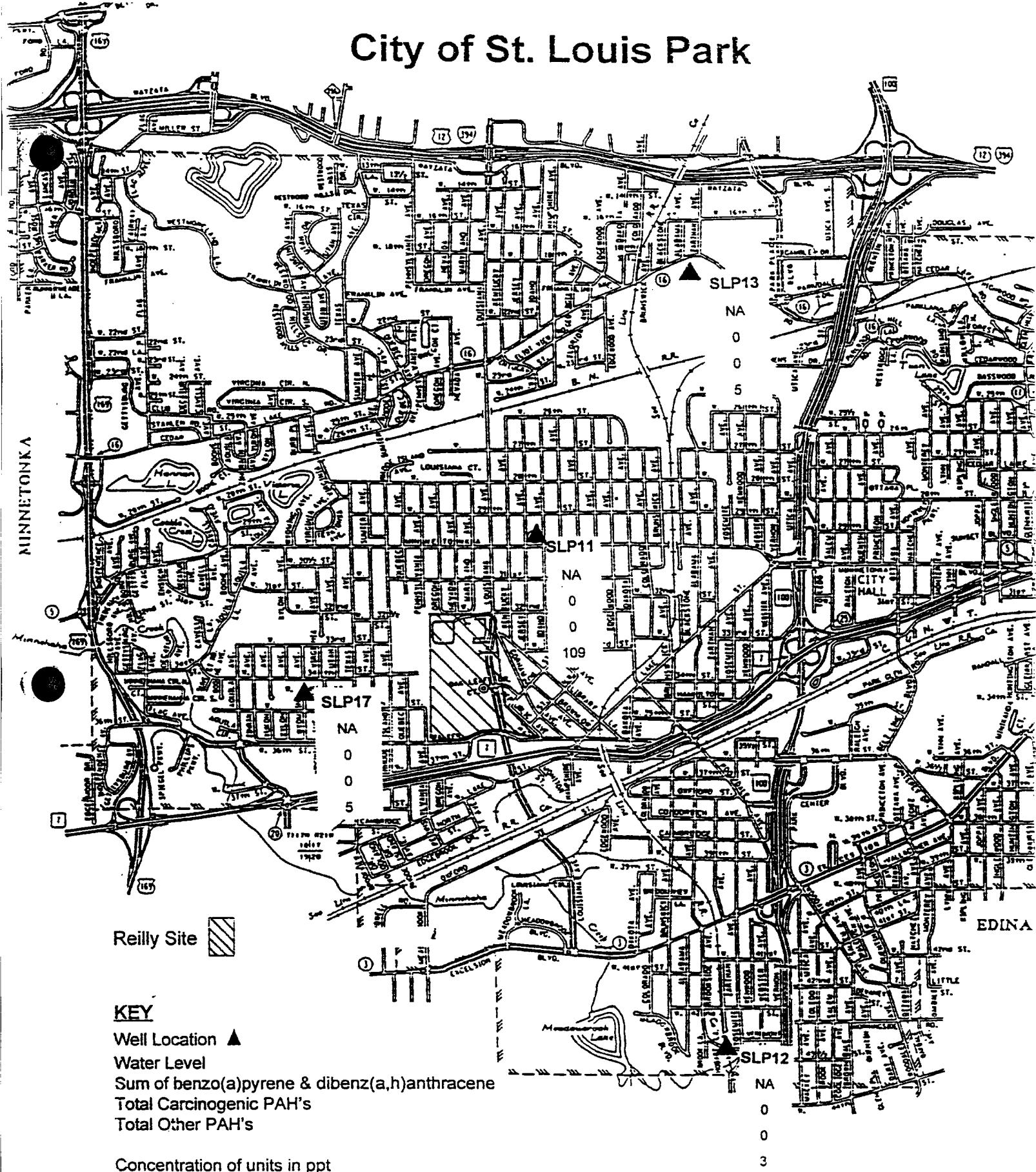
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## 2.0 MT. SIMON-HINCKLEY AQUIFER

In accordance with RAP Section 5.1, four wells in the Mt. Simon-Hinckley Aquifer were sampled once in 1996. A summary of the analytical data and the water level elevations at the four wells are shown on Figure 2-1. The laboratory reports of the analytical data are included as Appendix A, Section 5.1.

The sums of the concentrations of benzo(a)pyrene and dibenz(a,h)anthracene PAH, carcinogenic PAH, and other PAH in each well are below the advisory level for these compounds. The results for all four wells are consistent with historical water quality for the aquifer. It appears that the Mt. Simon-Hinckley Aquifer has not been significantly affected by contaminants originating from the former Reilly Tar & Chemical (Reilly) site.

# City of St. Louis Park



**Figure 2-1**  
**Summary of Ground Water Monitoring Results**  
**for the Mount Simon Hinckley Aquifer 1996**

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### **3.0 IRONTON-GALESVILLE AQUIFER**

Analytical results from ground water samples collected during 1987 through 1991 from well W105 had consistently met the criterion (less than 10 parts per billion [10,000 parts per trillion] total PAH) for discontinuing the 25 gallons per minute (gpm) pumping rate. Therefore, in accordance with CD-RAP Section 6.1.5, the pump in well W105 was inactivated on December 23, 1991, and remains inactivated.

Ground water samples were collected once in 1996, as required by the CD-RAP during the fifth year after cessation of pumping in well W105.

Analytical results from the 1996 sampling event (2,775 ppt total PAH) is provided in Appendix B, Section 6.2.1, and presented in Table 3-1. Water quality results from the 1996 sampling event is presented in Figure 3-1.

**Table 3-1**  
**Historical Summary of Other PAH and**  
**CPAH in Well W105**  
**1988 through 1996**

<b>W105</b>		
<b>Sampling Date</b>	<b>Total CPAH<sup>1</sup></b>	<b>Total Other PAH<sup>2</sup></b>
2-88	0	9,000
6-88	0	2,400
9-88	0	3,670
12-88	0	2,035
6-89	0	1,400
12-89	0	1,086
5-90	0	2,347
8-90	0	2,600
5-91	9.5	2,164
8-91	0	1,014
2-92	0	2,185
6-92	355	5,057
11-92	0	30,900
1-11-93	38	1,797
1-19-93	23	1,966
3-29-94	60	2,576
5-21-96	29	2746

**NOTES:**

<sup>1</sup>Total Carcinogenic PAHs (as listed in the CD/RAP (A.1.1), consist of the sum of:

benzo(a) anthracene	indeno(1,2,3-cd)pyrene
benzo(b)pyrene	quinoline*
benzo(b)flouranthene	benzo(j)fluoranthene**
chrysene	benzo(g,h,i)perylene
dibenz(a,h)anthracene	

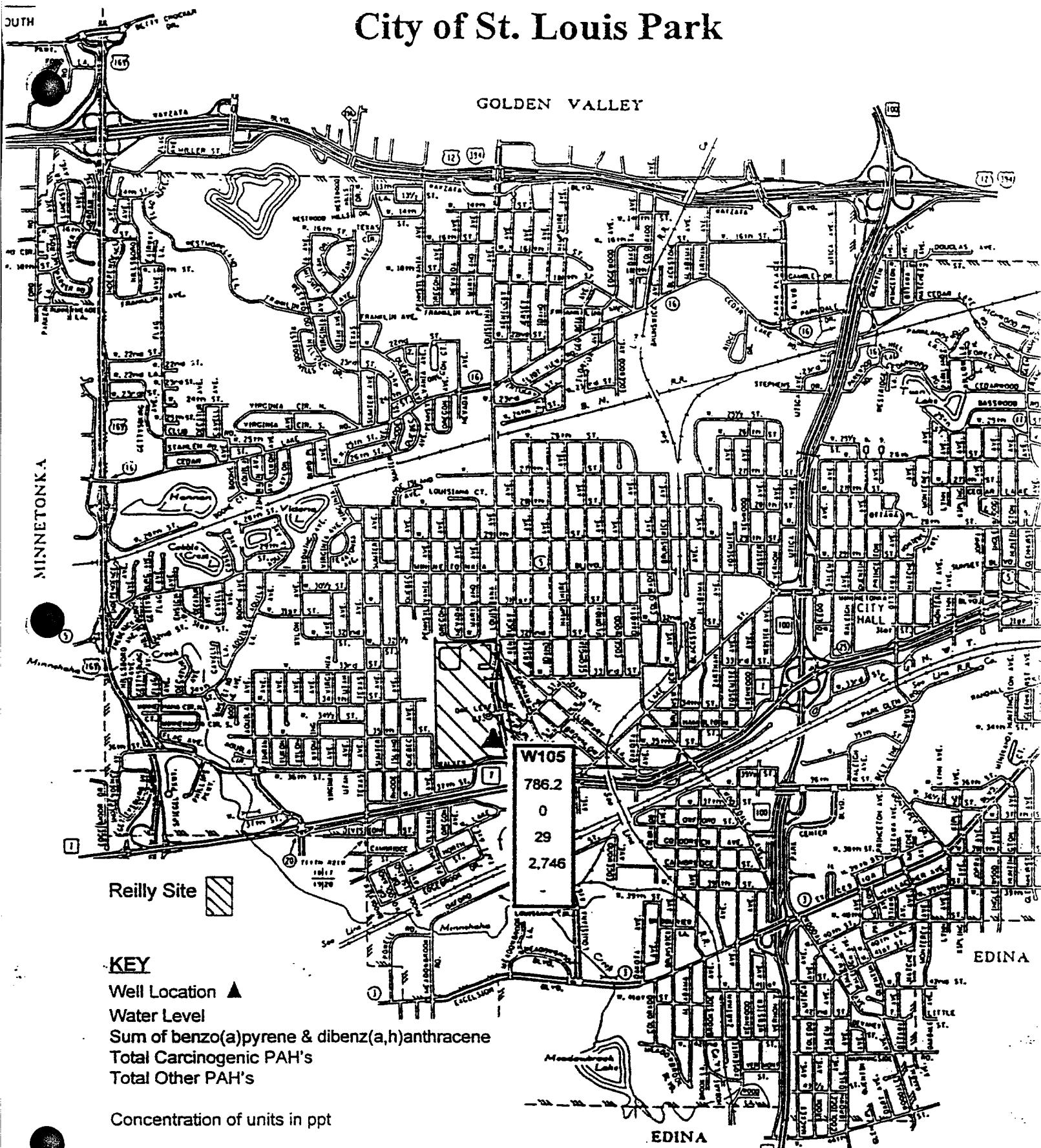
\*Quinoline is included in the sum of CPAH if other CPAHs were detected. If no CPAHs are detected, quinoline is included in the Total Other PAH.

\*\*Benzo(j)fluoranthene will coelute with either benzo(b)fluoranthene or benzo(k)fluoranthene. Benzo-(j)flouranthene can not be consistently separated by the laboratory. Therefore if present, it will be reported as benzo(b)- and/or benzo(k)-fluoranthene.

<sup>2</sup>Total Other PAHs (as listed in the CD/RAP (A.1.2), consists of the sum of:

acenaphthene	biphenyl	indene
acenaphthylene	carbazole	indole
acridine	dibenzofuran	1-methylnaphthalene
anthracene	dibenzothiophene	2-methylnaphthalene
benzo(k)fluoranthene	2,3-dihydroindene	naphthalene
2,3-benzofuran	fluoranthene	perylene
benzo(e)pyrene	fluorene	phenanthrene
benzo(b)thiophene		pyrene

# City of St. Louis Park



**Figure 3-1**  
**Summary of Ground Water Monitoring Results**  
**for the Ironton-Galesville Aquifer 1996**

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## 4.0 PRAIRIE DU CHIEN-JORDAN AQUIFER

In accordance with RAP Section 7.3, Prairie du Chien-Jordan Aquifer wells were monitored per the frequency outlined in the 1996 Sampling Plan. In addition to water quality monitoring, ground water elevations were measured at the Prairie du Chien-Jordan Aquifer wells during sampling. Wells SLP5, W119, and H3 were omitted from sampling during 1996 because owners have taken these wells out of service. Additionally, well W48 was only sampled once because the pump at W48 was not working during the second sampling event. A total of 22 wells were used to collect ground water samples during 1996.

Summaries of analytical data and ground water elevations for the sampling rounds are shown in Figures 4-1 and 4-2 (in pocket). These two figures indicate that ground water flow in the aquifer is greatly affected by the pumping of wells and is dependent upon the pumping rate and the time the specific measurements were recorded (e.g., pump may have been recently shut off, or turned on). Some of the municipal wells (i.e. SLP10/15, E7, SLP4) pump at greater than 1,000 gallons per minutes and have a considerable effect on localized ground water flow. However, these wells systematically turn on and turn off, therefore, the general ground water flow is effected by which wells are pumping and at what rates. Figures 4-1 and 4-2 indicate a snapshot in time of the ground water flow and is not indicative of the long-term flow. Currently, a ground water flow model is being finalized by Justin Blum and Hennepin County that may give a better estimation on ground water flow in the Prairie du Chien Aquifer.

Table 4-1 presents a historical summary of analytical results from 1988 through 1996 for Prairie du Chien-Jordan Aquifer wells. Laboratory reports of the monitoring are presented in Appendix C. The amount and distribution of PAH in the aquifer in 1996 was consistent with historical patterns and continues to show a decreasing trend of PAH concentrations in several wells including W23, W48, SLP16, and SLP10, while remaining fairly steady in the other wells. In 1996, other PAH were detected in concentrations ranging from 3 ppt (E7 and H6) to 50,000 ppt (well W23). A total of six wells, out of 22 wells, exceed the drinking water criterion for other PAH (280 ppt) (W23, SLP10, W40, W70, SLP4 and W402).

The levels of total carcinogenic PAH detected range from below detectable levels in several wells (including all municipal wells) to 13 ppt, (W48). All wells were below the drinking water criteria of 28 ppt.

**Table 4-1**  
**Historical Suammary of Other PAH and**  
**CPAH Analytical Results**

**Prairie du Chien Aquifer Wells**

All concentrations reported in nanograms per liter

SLP4		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	244
10-89	0	232
3-90	0	210
6-90	2	238
11-92	3	309
3-93	0	237
6-93	0	235
3-94	0	552
10-94	1	570
9-95	3	561
12-95	6	229
6-96	0	431
9-96	0	526

SLP5		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
10-88	0	613
6-89	0	94
6-90	0	49
5-91	1	42
6-92	1	71
8-93	5	77

SLP6		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	33
10-88	0	55
6-89	7	52
9-89	0	36
10-89	0	40
3-90	0	45
6-90	3	80
8-90	0	117
10-90	0	68
8-91	0	123
5-92	1	123
11-92	0	173
3-93	0	212
6-93	0	113
2-94	1	74
6-95	0	88
6-96	1	180
8-96	0	178
10-96	0	189

SLP7		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	78
10-88	0	51
6-89	0	61
9-89	0	25
10-89	0	25
3-90	0	43
6-90	2	48
8-90	2	91
10-90	0	49
3-91	0	50
5-91	0	37
8-91	0	65
5-92	1	40
3-93	0	32
6-94	0	60
6-95	0	28
6-96	0	22

SLP8		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	18
6-89	0	8
10-89	0	9
3-90	0	15
3-91	0	50
5-92	1	19
11-92	2	9

SLP10		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	8,200
10-89	0	5,120
6-90	0	5,403
8-90	0	7,386
5-91	5	315
6-92	0	3,070
8-93	0	2,091
6-94	0	2,174
8-95	0	1,737
6-96	0	1,742

SLP14		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	112
6-89	0	134
9-89	0	84
3-90	0	98
8-90	0	145
5-91	1	99
8-91	0	19
5-92	1	90
8-93	0	78
9-94	0	57
6-95	0	89
6-96	0	52

SLP15		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
6-89	0	4,026
11-92	0	3,206
8-93	0	2,091

Table 4-1  
Historical Summary of Other PAH and  
CPAH Analytical Results

**Prairie du Chien Aquifer Wells**

All concentrations reported in nanograms per liter

<b>SLP16</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	48
6-89	0	28
9-89	0	24
8-90	8	374
11-90	0	59
5-91	1	32
8-91	0	64
11-92	1	42
8-93	0	11
6-94	0	22
6-95	0	13
6-96	0	8

<b>E2</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	14
6-89	0	21
9-89	0	8
6-90	3	22
8-90	0	14
5-91	4	21
8-91	0	17
5-92	0	19
8-93	0	9
6-94	0	16
12-95	0	10
6-96	0	14
10-96	0	20

<b>E3</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	15
6-89	0	15
6-90	1	17
8-91	0	13
5-92	4	21
8-93	0	5
6-94	0	7
6-95	0	8
6-96	0	3

<b>E7</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
6-96	0	3
10-96	0	5

<b>E13</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	4
6-89	0	20
9-89	0	6
6-90	0	13
8-90	2	227
5-91	1	11
8-91	0	12
5-92	0	43
8-93	0	4
6-94	0	3
6-96	0	3
10-96	0	4

<b>E15</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	11
6-89	0	16
6-90	0	11
5-91	0	13
5-92	0	23
8-93	0	4
6-94	0	6
6-95	0	8
6-96	0	10
10-96	0	29

<b>H3</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	378
6-89	0	93
9-89	0	370
6-90	0	188
8-90	0	5,300
Abandoned		

<b>H6</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	19
6-89	0	16
6-90	0	15
5-91	0	16
5-92	0	16
8-93	0	3
6-94	0	6
6-95	0	3
6-96	0	3

**Table 4-1**  
**Historical Suammary of Other PAH and**  
**CPAH Analytical Results**

**Prairie du Chien Aquifer Wells**

All concentrations reported in nanograms per liter

<b>MTK6</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	4
6-89	0	12
6-90	5	22
5-91	0	17
5-92	4	19
8-93	0	7
6-94	0	8
6-95	0	15
6-96	0	4

<b>W23</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
9-88	0	111,100
12-88	0	123,100
3-89	0	120,200
6-89	0	117,600
9-89	0	106,300
3-90	0	129,100
8-90	0	114,700
3-91	0	87,800
6-91	0	71,800
9-91	0	91,200
10-91	0	82,600
2-92	0	67,600
9-92	0	78,000
6-94	0	60,000
10-94	0	64,000
5-95	4,000	128,000
9-95	0	70,000
4-96	0	48,000
7-96	0	50,000

<b>W29</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	495
6-89	28	338
6-90	4	372
5-91	6	405
5-92	12	531
8-93	39	1,887
6-94	9	749
6-95	0	1,164
6-96	0	82

<b>W40</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	1,062
6-89	0	540
6-90	16	705
5-91	5	474
5-92	2	283
8-93	5	345
6-94	0	484
6-95	0	369
6-96	0	498

<b>W48</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	2,418
6-89	0	1,636
9-89	0	1,850
10-89	0	1,130
3-90	0	1,690
6-90	0	1,809
8-90	22	4,566
8-93	2	428
6-94	1	285
6-95	3	310
6-96	3	259

<b>W70</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	481
6-89	5	426
9-89	0	280
6-90	9	560
5-91	8	669
6-92	8	401
8-93	2	317
6-94	4	299
6-95	0	384
6-96	0	342

<b>W119</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	3
6-89	0	18
9-89	0	11

<b>W401</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	12
6-89	0	15
6-90	0	27
5-91	0	28
5-92	0	10
8-93	1	10
6-94	0	8
8-95	0	16
6-96	0	19
10-96	0	29

**Table 4-1**  
**Historical Suammary of Other PAH and**  
**CPAH Analytical Results**

**Prairie du Chien Aquifer Wells**

All concentrations reported in nanograms per liter

<b>W402</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
9-89	0	151
6-90	47	720
8-90	16	133
5-91	16	408
8-91	0	18,320
6-92	12	895
8-93	7	145
6-94	5	104
6-95	0	567
6-96	13	383

<b>W403</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
8-88	0	57
6-89	40	974
9-89	0	177
8-90	49	1,102
5-91	110	976
8-91	0	11,570
6-92	19	816
8-93	7	516
6-94	7	1,271
6-95	0	543
6-96	3	182

<b>W406</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
6-89	0	36
10-89	0	26
6-90	8	43
8-90	15	119
5-91	1	30
8-91	1	40
5-92	6	53
8-93	0	22
6-94	0	31
6-95	0	34
6-96	0	21

**NOTES:**

<sup>1</sup> Total Carcinogenic PAHs (as listed in the CD/RAP (A.1.1), consist of the sum of:

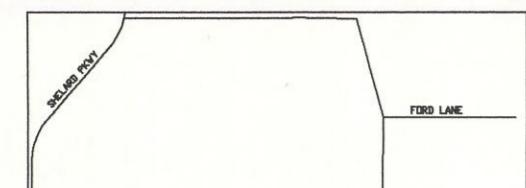
benzo(a) anthracene	Indeno(1,2,3-cd)pyrene
benzo(b)pyrene	quinoline*
benzo(b)flouranthene	benzo(j)fluoranthene**
chrysene	benzo(g,h,i)perylene
dibenz(a,h)anthracene	

\*Quinoline is included in the sum of CPAH if other CPAHs were detected. If no CPAHs are detected, quinoline is included in the Total Other PAH.

\*\*Benzó(j)fluoranthene will coelute with either benzo(b)fluoranthene or benzo(k)fluoranthene. Benzo(j)fluoranthene can not be consistently separated by the laboratory. Therefore if present, it will be reported as benzo(b)- and/or benzo(k)-fluoranthene.

<sup>2</sup> Total Other PAHs (as listed in the CD/RAP (A.1.2), consists of the sum of:

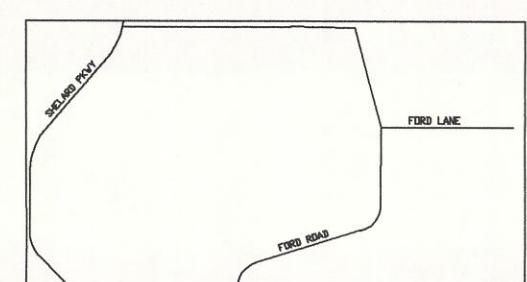
acenaphthene	biphenyl	indene
acenaphthylene	carbazole	indole
acridine	dibenzofuran	1-methylnaphthalene
anthracene	dibenzothiophene	2-methylnaphthalene
benzo(k)fluoranthene	2,3-dihydroindene	naphthalene
2,3-benzofuran	fluoranthene	perylene
benzo(e)pyrene	fluorene	phenanthrene
benzo(b)thiophene		pyrene



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## 5.0 ST. PETER AQUIFER

In accordance with the 1996 Sampling Plan, 12 St. Peter Aquifer wells were monitored twice (first half/second half) in 1996. In addition to water quality monitoring, ground water elevations were measured in the St. Peter Aquifer wells during each monitoring round. Summaries of analytical data and ground water elevations for the first half and second half of 1996 are shown in Figures 5-1 and 5-2 (in pocket). Laboratory results of the monitoring are provided in Appendix D.

A historical summary of total PAH and carcinogenic PAH results from 1988 through 1996 is presented in Table 5-1. The data in Table 5-1 show several trends. Total PAH concentrations have remained relatively stable for wells SLP3, W410, W122, W129, W411, W408, and P116, while total PAH concentrations show a downward trend in ground water samples collected from W133, W33 and W24. PAH concentrations in ground water samples collected from W412 have fluctuated on a year-to-year basis over the last nine years of monitoring but overall the PAH concentrations are relatively stable over this period.

Carcinogenic PAH were not detected in any St. Peter aquifer well.

Ground water samples collected from wells W409 exhibit increasing total PAH concentrations when compared to previous years' analytical data. Well W409 is apparently being impacted by PAH sources at the Reilly site that are flowing to well W409 in response to pumping well W410.

The total PAH concentration at well W410 has remained relatively stable since pumping began. The PAH concentrations of ground water samples since 1992 have ranged from approximately 13,000 ppt to 21,000 ppt. The pumping rate for well W410 averaged 78.4 gpm during 1996.

In conclusion, the 1996 sampling results for the St. Peter Aquifer appear to accurately represent water quality conditions in the aquifer. The operation of well W410 does appear to be effective in controlling the flow of ground water as evidenced by the 1996 water quality changes, and the water level contours shown in Figures 5-1 and 5-2. Continued monitoring in accordance with the 1997 Sampling Plan will allow continued evaluation of water quality in the St. Peter Aquifer.

**Table 5-1**  
**Historical Summary of Other PAH and**  
**CPAH Analytical Results**

**St. Peter Aquifer Wells**

All concentrations reported in nanograms per liter.

<b>SLP3</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	0	8
10-88	0	9
6-89	0	10
10-89	0	15
6-90	5	29
8-90	1	18
8-91	1	23
6-92	0	16
11-92	0	13
4-93	0	9
7-93	0	5
5-94	0	8
10-94	0	5
5-95	0	7
10-95	0	16
6-96	0	11
10-96	0	4

<b>P116</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	8	196
10-88	0	3,770
6-89	1	82
10-89	3	42
8-90	2	20
4-91	0	61
8-91	3	40
6-92	13	118
11-92	10	219
4-93	4	52
7-93	2	38
5-94	1	64
11-94	0	66
5-95	0	50
10-95	0	53
6-96	0	7
10-96	0	43

<b>W14</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	57	95
10-88	0	439

<b>W24</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	0	3,309
10-88	0	3,622
4-91	0	4,023
8-91	0	4,160
6-92	0	3,380
11-92	0	3,650
4-93	0	2,950
7-93	0	3,294
5-94	0	2,669
11-94	0	4,029
5-95	0	3,190
10-95	0	1,550
5-96	0	974
10-96	0	1,603

**Table 5-1**  
**Historical Summary of Other PAH and**  
**CPAH Analytical Results**

**St. Peter Aquifer Wells**

All concentrations reported in nanograms per liter.

<b>W33</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	0	16,430
10-88	0	12,455
8-90	0	290
4-91	0	17,912
8-91	0	9,921
6-92	0	3,448
11-92	14	3,304
4-93	0	1,334
7-93	0	1,000
5-94	8	968
11-94	0	1,700
5-95	0	1,901
10-95	0	1,062
5-96	0	566
10-96	0	655

<b>W122</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	21	142
10-88	0	2,246
6-89	20	965
10-89	15	114
4-91	36	757
8-91	10	853
6-92	43	568
11-92	7	179
4-93	32	308
7-93	24	330
5-94	23	583
10-94	10	374
5-95	0	281
10-95	11	220
6-96	0	144
10-96	0	235

<b>W129</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	0	88
10-88	0	290
6-89	0	27
10-89	0	43
6-90	0	143
8-90	0	96
4-91	27	159
8-91	0	430
6-92	47	247
11-92	5	296
4-93	15	121
7-93	2	53
5-94	0	171
11-94	2	110
5-95	12	94
10-95	0	55
6-96	0	53
10-96	0	75

<b>W133</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	0	52,370
10-88	0	29,830
6-89	0	37,870
10-89	0	21,099
6-90	0	19,448
8-90	0	14,030
4-91	5	2,587
8-91	0	4,610
6-92	0	2,453
11-92	0	1,920
4-93	0	1,134
7-93	0	836
5-94	5	665
10-94	0	434
5-95	0	165
10-95	0	157
5-96	0	142
10-96	0	285

**Table 5-1**  
**Historical Summary of Other PAH and**  
**CPAH Analytical Results**

**St. Peter Aquifer Wells**

All concentrations reported in nanograms per liter.

<b>W408</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	2	151
10-88	0	34
6-89	5	145
10-89	0	110
6-90	0	24
8-90	28	130
4-91	13	343
8-91	25	1,163
6-92	32	283
11-92	2	172
4-93	4	150
7-93	6	217
5-94	5	70
11-94	0	170
5-95	9	143
10-95	15	135
6-96	0	66
10-96	0	103

<b>W409</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	159	2,198
10-88	0	890
6-89	53	571
10-89	0	830
6-90	0	141
8-90	43	200
4-91	0	360
8-91	0	3,833
6-92	0	49,660
11-92	0	49,399
4-93	0	50,060
7-93	0	42,440
5-95	0	173,000
10-95	0	167,000
4-96	0	805,420
10-96	0	312,500

<b>W410</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	0	1,288
10-88	0	1,435
6-89	5	424
10-89	0	357
4-91	0	85
8-91	0	5,330
2-92	0	14,070
6-92	0	12,850
11-92	0	16,470
4-93	0	17,600
7-93	0	16,609
5-94	0	14,505
10-94	0	20,880
5-95	0	21,640
10-95	0	13,940
5-96	0	15,970
10-96	0	14,170

<b>W411</b>		
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>
7-88	0	1,274
10-88	0	1,161
6-89	8	200
10-89	0	460
6-90	15	451
8-90	0	336
4-91	12	384
8-91	0	251
6-92	24	313
11-92	1	181
4-93	7	189
7-93	5	113
5-94	3	120
11-94	6	219
5-95	6	235
10-95	1	183
6-96	0	79
10-96	0	253

**Table 5-1**  
**Historical Summary of Other PAH and**  
**CPAH Analytical Results**

**St. Peter Aquifer Wells**

All concentrations reported in nanograms per liter.

<b>W412</b>		
<b>Sampling Date</b>	<b>Total CPAH<sup>1</sup></b>	<b>Total Other PAH<sup>2</sup></b>
7-88	8	1,309
10-88	0	209
6-89	18	211
10-89	0	132
8-90	1	484
4-91	48	1,470
8-91	0	5,283
6-92	12	1,319
11-92	0	3,796
4-93	154	842
7-93	16	777
5-94	25	291
10-94	10	538
5-95	18	369
10-95	0	402
5-96	0	139
10-96	0	1,620

**NOTES:**

<sup>1</sup> Total Carcinogenic PAHs (as listed in the CD/RAP (A.1.1), consist of the sum of:

benzo(a) anthracene	indeno(1,2,3-cd)pyrene
benzo(b)pyrene	quinoline*
benzo(b)flouranthene	benzo(j)fluoranthene**
chrysene	benzo(g,h,i)perylene
dibenz(a,h)anthracene	

\*Quinoline is included in the sum of CPAH if other CPAHs were detected.

If no CPAHs are detected, quinoline is included with the Total Other PAH.

\*\*Benzo(j)fluoranthene will coelute with either benzo(b)fluoranthene or benzo(k)fluoranthene. Benzo(j)fluoranthene can not be consistently separated by the laboratory. Therefore if present, it will be reported as benzo(b)- and/or benzo(k)-fluoranthene.

<sup>2</sup> Total Other PAHs (as listed in the CD/RAP (A.1.2), consists of the sum of:

acenaphthene	2,3-dihydroindene
acenaphthylene	fluoranthene
acridine	fluorene
anthracene	indene
benzo(k)fluoranthene	indole
2,3-benzofuran	1-methylnaphthalene
benzo(e)pyrene	2-methylnaphthalene
benzo(b)thiophene	naphthalene
biphenyl	perylene
carbazole	phenanthrene
dibenzofuran	pyrene
dibenzothiophene	

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## **6.0 DRIFT-PLATTEVILLE AQUIFER**

### **6.1 Drift-Platteville Aquifer Source and Gradient Control Wells**

Ground water monitoring for the Drift-Platteville Aquifer in 1996 included quarterly PAH and phenolics monitoring of wells W420, W422, and W439, the Drift Aquifer source and gradient control wells, and W421, the Platteville Aquifer source control well. Wells W420, W421, and W422 have been monitored quarterly since they began pumping in 1987 and this is the second year of quarterly monitoring for well W439 since pumping began in early 1995. Average pumping rates for 1996 for wells W420, W421, W422, and W439 were 36.7, 27.9, 65.3 and 54.6 gpm, respectively. The monitoring data are presented on Figures 6-1, 6-2, 6-3, and 6-4. The laboratory reports of the analytical data are included in Appendix E, Sections 9.1.3 and 9.2.3.

Other PAH, carcinogenic PAH and phenolic data for wells W420, W421, W422, and W439 are summarized in Table 6-1. Table 6-1 shows that near the source of contamination, PAH concentrations in ground water are consistently in the range of several hundred micrograms per liter to low milligrams per liter. The trends of these data suggest that while contaminant levels have fluctuated approximately 10 percent in the past several years, the overall levels can be described as stable.

### **6.2 Platteville Aquifer Monitoring**

Ground water monitoring for 20 Platteville Aquifer monitoring wells in 1996 consisted of two round of sample collection and analysis for PAH, and water level measurements. These 20 monitoring wells were required to be sampled per the ROD for the northern area of the Platteville Aquifer.

Figure 6-5 and Figure 6-6 (in pocket) shows the results from the two monitoring rounds for the Platteville Aquifer. Laboratory reports of the monitoring are presented in Appendix E, Section 9.5. Table 6-2 is a historical summary of other PAH, carcinogenic PAH and phenolic data for Platteville wells. This table also includes data from Platteville wells not sampled this year.

The water level contours in Figures 6-5 and 6-6 show the influence of the Platteville Aquifer source control wells on the regional east-southeast ground water flow direction. Well W421 is currently being pumped at a rate of approximately 28 gpm, in accordance with the CD-RAP, and appears to be effective in controlling ground water in an area at least the size of the bog between Walker and Lake Streets.

# City of St. Louis Park

MINNETONKA

HOPKINS

Reilly Site

## KEY

Well Location ▲

Water Level

Sum of benzo(a)pyrene & dibenz(a,h)anthracene

Total Carcinogenic PAH's

Total Other PAH's

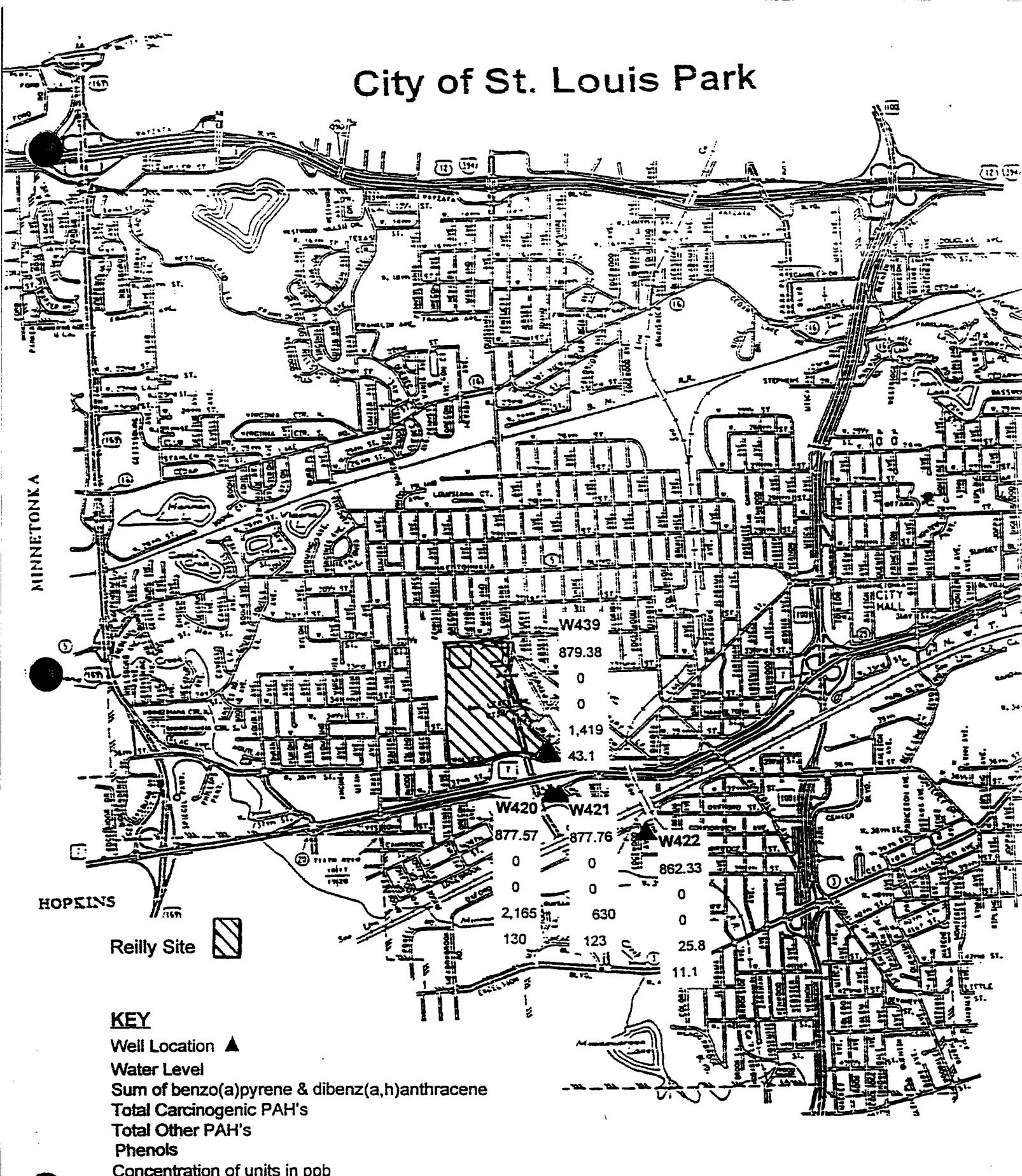
Phenols

Concentration of units in ppb



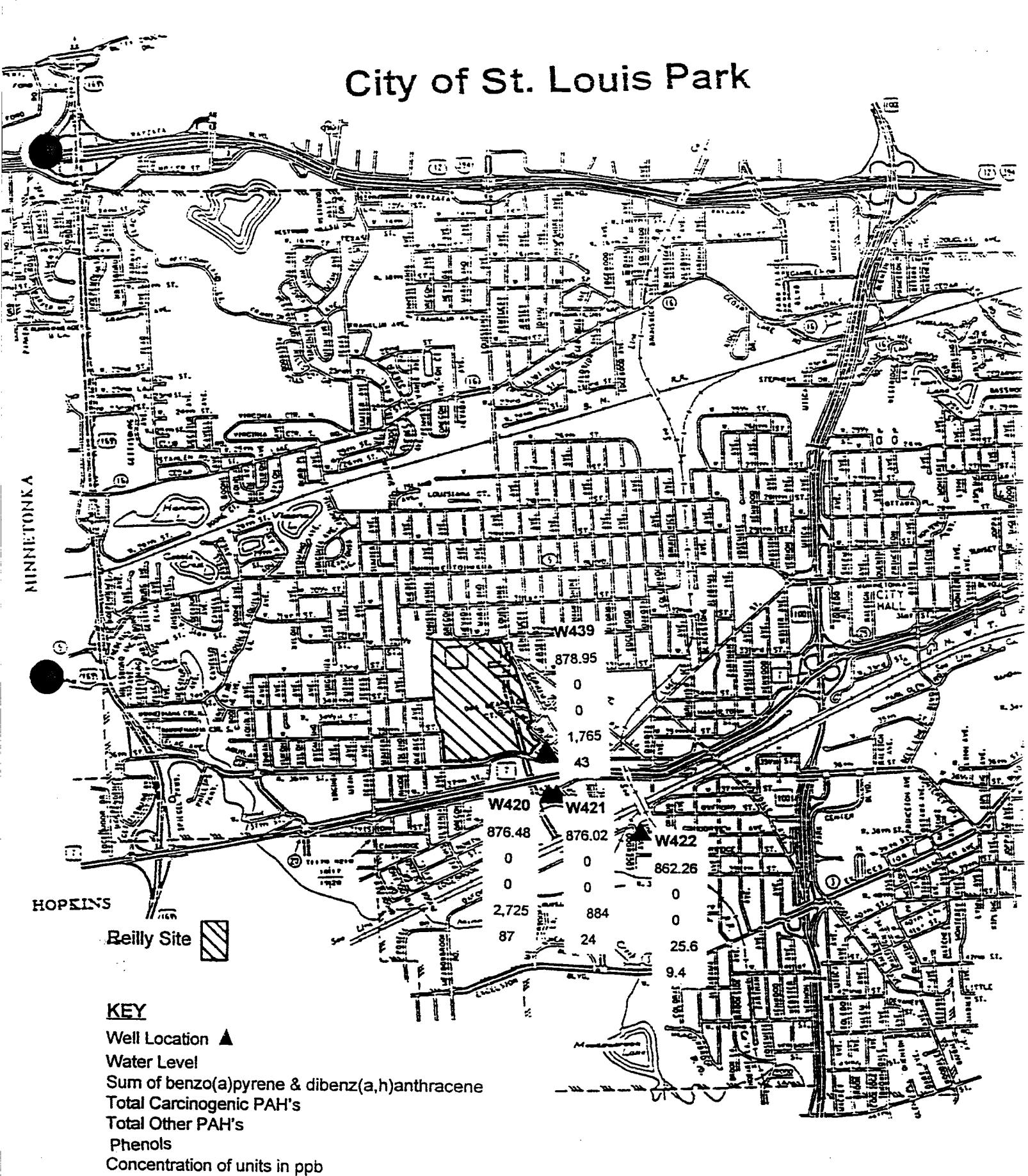
Figure 6-1  
Summary of Ground Water Monitoring Results  
for the Drift-Platteville Aquifer 1996  
1<sup>st</sup> Quarter

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**Figure 6-2**  
**Summary of Ground Water Monitoring Results**  
**for the Drift-Platteville Aquifer 1996**  
**2<sup>nd</sup> Quarter**

# City of St. Louis Park



**Figure 6-3**  
**Summary of Ground Water Monitoring Results**  
**for the Drift-Platteville Aquifer 1996**  
**3<sup>rd</sup> Quarter**

# City of St. Louis Park



Figure 6-4  
Summary of Ground Water Monitoring Results  
for the Drift-Platteville Aquifer 1996  
4<sup>th</sup> Quarter

**Table 6-1**

**Historical Summary of Other PAH and  
CPAH and Phenolics  
Wells W420, W421, W422, and W439  
1988 through 1996**

<b>W420</b>			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
1st Quarter	0	3,242	440
2nd Quarter	0	3,420	330
8-88 <sup>3</sup>	0	2,477	220
10-88	0	1,148	44
3-89	0	2,400	120
6-89	0	3,400	129
9-89	0	3,400	220
12-89	0	3,400	110
3-90	0	3,950	239
5-90	0	2,430	231
8-90	0	3,150	244
12-90	0	3,030	228
3-91	0	4,200	232
6-91	0	2,494	221
9-91	0	4,967	210
10-91	0	4,163	194
2-92	0	1,526	177
6-92	0	3,229	204
9-92	0	2,281	167
10-92	0	2,374	236
3-93	0	4,337	18
4-93	0	2,929	207
8-93	0	1,825	136
11-93	0	2,052	148
2-94	0	2,033	109
6-94	0	2,181	151
8-94	0	2,026	147
10-94	0	2,082	151
3-95	0	2,431	143
5-95	0	1,873	134
9-95	0	2,523	91
10-95	0	2,332	113
2-96	0	1,968	121
4-96	0	2,165	130
7-96	0	2,725	87
10-96	0	2,164	118

<b>W421</b>			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
1st Quarter	0	566	33
2nd Quarter	0	821	0
8-88 <sup>3</sup>	0	764	30
10-88	0	1,107	35
3-89	0	878	29
6-89	0	1,000	26
9-89	0	1,000	33
12-89	0	730	27
3-90	0	1,420	33
5-90	0	715	29
8-90	0	1,410	36
12-90	0	1,145	29
3-91	0	1,449	30
6-91	10	1,389	31
9-91	0	1,226	27
10-91	0	1,285	30
2-92	0	988	31
6-92	0	1,163	26
9-92	0	1,547	28
10-92	0	1,299	45
3-93	0	1,332	15
4-93	0	1,184	21
8-93	0	1,025	32
11-93	0	1,017	29
2-94	0	1,045	14
6-94	0	939	17
8-94	0	788	31
10-94	0	966	24
3-95	0	949	31
5-95	0	911	19
9-95	0	966	29
10-95	0	764	20
2-96	0	618	28
4-96	0	630	123
7-96	0	884	24
10-96	0	843	24

Table 6-1

**Historical Summary of Other PAH and  
CPAH and Phenolics**  
**Wells W420, W421, W422, and W439**  
**1988 through 1996**

W422				W439			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics	Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
1st Quarter	0	27	11	3-95	0	3,933	91
2nd Quarter	0	57	0	5-95	0	4,053	74
8-88 <sup>3</sup>	0	77	24	9-95	0	2,564	54
10-88	0	50	84	10-95	0	2,115	50
3-89	0	50	11	2-96	0	1,552	46
6-89	0	50	14	4-96	0	1,419	43
9-89	0	60	20	7-96	0	1,765	43
12-89	0	50	13	10-96	0	1,557	45
3-90	0	75	21				
5-90	0	60	14				
8-90	0	90	14				
12-90	0	60	18				
4-91	0	67	13				
9-91	0	-	17				
10-91	0	88	18				
2-92	0	121	16				
6-92	0	872	-				
9-92	0	91	9				
10-92	0	89	28				
3-93	0	94	0				
4-93	0	96	10				
8-93	0	81	16				
11-93	0	74	16				
2-94	0	61	0				
6-94	0	66	7				
8-94	0	66	30				
10-94	0	59	11				
3-95	0	54	11				
5-95	0	62	5				
9-95	0	53	14				
10-95	0	29	10				
2-96	0	24	12				
4-96	0	26	11				
7-96	0	26	9				
10-96	0	23	8				

<sup>1</sup> Total Carcinogenic PAHs (as listed in the CD/RAP (A.1.1), consist of the sum of:

benzo(a) anthracene	chrysene	quinoline*
benzo(b)pyrene	dibenz(a,h)anthracene	benzo(j)fluoranthene**
benzo(b)flouranthene	indeno(1,2,3-cd)pyrene	benzo(g,h,i)perylene

\*Quinoline is included in the sum of CPAH if other CPAHs were detected. If no CPAHs are detected, quinoline is included in the Total Other PAH.

\*\*Benzo(j)fluoranthene will coelute with either benzo(b)fluoranthene or benzo(k)fluoranthene. Benzo(j)fluoranthene can not be consistently separated by the laboratory. Therefore, if present, it will be reported as benzo(b)- and/or benzo(k)-fluoranthene.

<sup>2</sup> Total Other PAHs (as listed in the CD/RAP (A.1.2), consists of the sum of:

acenaphthene	benzo(a)pyrene	2,3-dihydroindene	1-methylnaphthalene
acenaphthylene	benzo(b)thiophene	fluoranthene	2-methylnaphthalene
acridine	biphenyl	fluorene	naphthalene
anthracene	carbazole	indene	perylene
benzo(k)fluoranthene	dibenzothiophene	indole	phenanthrene
2,3-benzofuran			pyrene

<sup>3</sup> Analyzed for PAHs with parts per billion (ug/L) detection limits.

**Table 6-2**  
**Historical Summary of Other PAH, CPAH, and**  
**Phenolic Analytical Results**

**Platteville Aquifer Wells**

All concentrations in nanograms per liter

W101			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>4</sup>	0	4,000	7
10-88	0	23,300	0
6-89	0	47,800	20
5-90	0	21,800	0
2-92	0	18,300	6
5-94	0	10,839	0
5-96	0	5,320	NA
10-96	0	32,380	NA

W121			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>4</sup>	0	0	73
10-88	5	392	35
6-89	5	378	35
5-90	12	282	0
5-94	40	166	0
5-96	0	141	NA
10-96	4	141	NA

W124			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>4</sup>	0	0	0
10-88	0	166	0
6-89	0	149	0
5-90	11	92	0
5-94	21	137	0
6-96	0	10	NA
9-96	0	0	NA

W128			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>4</sup>	0	0	12
10-88	0	273	0
6-89	0	212	0

W130			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>4</sup>	0	0	0
10-88	0	397	0
6-89	2	170	0
5-90	14	239	0
5-96	5	164	NA
10-96	0	52	NA

W131			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>4</sup>	0	0	0
10-88	0	305	13
6-89	0	172	0
2-92	0	13,080	0
5-94	31	224	0
5-96	28	149	NA
10-96	0	16	NA

**Table 6-2**  
**Historical Summary of Other PAH, CPAH, and**  
**Phenolic Analytical Results**

**Platteville Aquifer Wells**

All concentrations in nanograms per liter

<b>W132</b>			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
5-90	0	1,168	0

<b>W143</b>			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>3</sup>	0	0	0
10-88	0	240	0
6-89	0	1,262	33
5-96	0	1,212	NA
10-96	0	1,288	NA

<b>W424</b>			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>3</sup>	0	0	10
10-88	0	50.5	0
6-89	4	517	17
5-90	8	147	0
2-92	0	5,200	0
3-92	0	11,180	0
5-94	1	157	0
5-96	0	153	NA
10-96	0	120	NA

<b>W426</b>			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>3</sup>	1,300	905,300	25
10-88	0	638,800	35
6-89	0	497,800	80
2-92	0	82,100	15
3-92	0	46,900	NA
5-96	0	55,470	NA

<b>W428</b>			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
8-88 <sup>3</sup>	0	0	0
10-88	0	1,040	8
6-89	0	904	16
5-90	0	490	0
2-92	0	2460	6
3-92	0	8,816	NA
5-94	11	436	0
5-96	6	192	NA
10-96	0	240	NA

<b>W430</b>			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
5-90	0	0	0

**Table 6-2**  
**Historical Summary of Other PAH, CPAH, and**  
**Phenolic Analytical Results**

**Platteville Aquifer Wells**

All concentrations in nanograms per liter

W431			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
2-92	0	3,840	0
3-92	0	2,250	0
5-96	0	1,023	NA
10-96	0	1,583	NA

W432			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
2-92	0	7,782	6
3-92	0	3,750	NA
5-96	14	793	NA
10-96	0	2,920	NA

W433			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
5-96	0	426	NA
10-96	0	625	NA

W434			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
2-92	0	4,200	9
10-96	0	4,351	NA

W435			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
2-92	0	0	0
3-92	0	813	0

W437			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
2-92	0	3,096,000	20
3-92	0	488,800	NA

**Table 6-2**  
**Historical Summary of Other PAH, CPAH, and**  
**Phenolic Analytical Results**

**Platteville Aquifer Wells**

All concentrations in nanograms per liter

W438			
Sampling Date	Total CPAH <sup>1</sup>	Total Other PAH <sup>2</sup>	Total Phenolics
2-92	0	20,400	5
3-92	0	0	NA

**NOTES:**

<sup>1</sup> Total Carcinogenic PAHs (as listed in the CD/RAP (A.1.1), consist of the sum of:

benzo(a)anthracene	indeno(1,2,3-cd)pyrene
benzo(b)pyrene	quinoline*
benzo(b)flouranthene	benzo(j)fluoranthene**
chrysene	benzo(g,h,i)perylene
dibenz(a,h)anthracene	

\*Quinoline is included in the sum of CPAH if other CPAHs were detected. If no CPAHs are detected, quinoline is included in the Total Other PAH.

\*\*Benzo(j)fluoranthene will coelute with either benzo(b)fluoranthene or benzo(k)fluoranthene. Benzo(j)fluoranthene can not be consistently separated by the laboratory. Therefore if present, it will be reported as benzo(b)- and/or benzo(k)-fluoranthene.

<sup>2</sup> Total Other PAHs (as listed in the CD/RAP (A.1.2), consists of the sum of:

acenaphthene	biphenyl	indene
acenaphthylene	carbazole	indole
acridine	dibenzofuran	1-methylnaphthalene
anthracene	dibenzothiophene	2-methylnaphthalene
benzo(k)fluoranthene	2,3-dihydroindene	naphthalene
2,3-benzofuran	fluoranthene	perylene
benzo(e)pyrene	fluorene	phenanthrene
benzo(b)thiophene		pyrene

<sup>3</sup> Analyzed for PAHs with parts per billion (ug/L) detection limits.

NA = Not analyzed for identified compound class.

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The Platteville Aquifer water level contours shown in Figures 6-5 and 6-6 support the interpretation that well W421 is an effective source control well.

Figures 6-5 and 6-6 also shows a significant degree of control exerted on the Platteville ground water in the vicinity of the Drift-Platteville Aquifer gradient control well (W422). Well W422 currently is being pumped at a rate of approximately 65 gpm and appears to be effective in controlling ground water over a large portion of the Drift-Platteville Aquifer.

The historical water quality data shown in Table 6-2 indicate a decreasing trend in PAH concentrations in most of the Platteville wells. Other Platteville wells have been consistent with historical observations, while no Platteville monitoring wells appear to be showing an increasing trend in PAH concentration.

During 1996, it appears that the Platteville Aquifer source well (W421) remained effective in controlling the spread of contamination in the vicinity of the Reilly site.

Figure 6-7 indicates the area of inferred contamination in the Platteville Aquifer. Figure 6-7 was generated by inferring that ground water from each well was contaminated if water quality exceeded the drinking water criteria as stated in the CD/RAP. However, if other criteria provided by both U.S. EPA and the Minnesota Department of Health (MDH) are used, then there would be no inferred area of contamination. No Platteville Aquifer ground water PAH concentrations exceed EPA and MDH criteria as described below.

The U.S. EPA established a maximum contamination level (MCL) for benzo(a)pyrene, at a level of 0.0002 mg/l or 200 ppt. U.S. EPA stated that not enough information regarding toxicity, carcinogenicity, occurrence, and exposure were available for the other PAH compounds on the proposed list, and that they were considering using a comparative cancer potency approach, wherein the individual potencies of PAH compounds would be compared to that of benzo(a)pyrene.

U.S. EPA's "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons" (EPA/600/R-93/089, July 1992) gives the comparative potencies of the other PAH compounds and indicates that no PAH are considered more potent than benzo(a)pyrene, and any health-based criteria for those compounds would be at a concentration proportionally higher than benzo(a)pyrene's 0.0002 mg/l.

---

**Figure Frame**

**6-7 Inferred Area of Contamination in the Platteville Aquifer - 1996 (CD/RAP Criteria)**

**Pages: 1**

---

In addition to U.S. EPA's regulations, MDH (MN Rules 4717.7100 to 4717.7800) has recently established Health Risk Limits (HRLs) for various compounds in drinking water, including six noncarcinogenic PAH:

Compound	HRL ( $\mu\text{g/L}$ )
Acenaphthene	400
Anthracene	2,000
Fluoranthene	300
Fluorene	300
Naphthalene	300
Pyrene	<u>200</u>
<b>Sum Total</b>	<b>3,500</b>

The inferred area of contamination in the Platteville, as indicated on Figure 6-7, is based upon CD/RAP criteria. On the other hand, if either or both the U.S. EPA and MDH criteria were used, there would not be any ground water considered to be contaminated.

# CITY OF ST. LOUIS PARK

NON-RESPONSIVE

# CITY OF ST. LOUIS PARK

NON-RESPONSIVE

# CITY OF ST. LOUIS PARK

NON-RESPONSIVE



**APPENDIX A  
LABORATORY DATA SUMMARY PACKAGE:  
MOUNT SIMON - HINCKLEY AQUIFER**

**WELLS**

SLP 11  
SLP 12  
SLP 13  
SLP 17

# CITY OF ST. LOUIS PARK

## Mount Simon Hinckley Aquifer 1996 PAH Quality Control Summary

Well No.	Date	Method Blank	Field Duplicate	Matrix Spike	Matrix Spike Dup	Field Blank
----------	------	--------------	-----------------	--------------	------------------	-------------

### RAP Section 5.1

SLP11	6/18/96	SBLK01-49718	MSH-SLP11D-061896	MSH-SLP11MS-061896	MSH-SLP11MSD-061896	MSH-SLP11FB-061896
SLP12	6/18/96	SBLK01-49718	MSH-SLP11D-061896	MSH-SLP11MS-061896	MSH-SLP11MSD-061896	MSH-SLP11FB-061896
SLP13	6/18/96	SBLK01-49718	MSH-SLP11D-061896	MSH-SLP11MS-061896	MSH-SLP11MSD-061896	MSH-SLP11FB-061896
SLP17	6/18/96	SBLK01-49718	MSH-SLP11D-061896	MSH-SLP11MS-061896	MSH-SLP11MSD-061896	MSH-SLP11FB-061896

**CITY OF ST. LOUIS PARK**  
**Mount Simon Hinckley Aquifer**  
**Analytical Result Summary**  
**1996**

Well	Coordinates	Date	Water Level	PAH Concentrations			<i>ug/L Phenols</i>
				B(a)P	D(a,h)A	Carcin	
SLP 11	923.67						
	2164042	6/18/96					109
	711980						
SLP 12	915.07						
	2167554	6/18/96					3
	701627						
SLP 13	906.44						
	2166784	6/18/96					5
	717085						
SLP 17	925.45						
	2159524	6/18/96					5
	708589						

WELL	SLP11	SLP12	SLP13	SLP17			
Date	6/18/96	6/18/96	6/18/96	6/18/96			
2,3-Benzofuran							
2,3-Dihydroindene	18		1.4				
1H-Indene	24						
Naphthalene	24						
Benzo (b) Thiophene	11						
1H-Indole							
2-Methylnaphthalene	2.1	1.2	1.8	2.3			
1-Methylnaphthalene	5.5						
Biphenyl							
Acenaphthylene							
Acenaphthene	11						
Dibenzofuran	2.2						
Fluorane	3.6						
Dibenzothiophene							
Phenanthrene	3.5	1.4	1.4	2.3			
Anthracene							
Acridine							
Carbazole	3.6						
Fluoranthene							
Pyrene							
12-Dimethylbenz(a)anthracene							
Benzo (e) Pyrene							
Perylene							
3-Methylcholanthrene							
DibenZ (A,C) Anthracene							
Quinoline	C						
Benzo (a) Anthracene	C						
Chrysene	C						
Benzo (b) Fluoranthene	C						
Benzo (k) Fluoranthene	C						
Benzo (a) Pyrene	C						
Indino (1,2,3-cd) Pyrene	C						
DibenZ (a,h) Anthracene	C						
Benzo (g,h,i) Perylene	C						
<b>TOTAL OTHER PAH</b>	108.5	2.6	4.6	4.6			
<b>BENO(a)PYRENE + DIBENZO(A,H)</b>	C	0	0	0			
<b>TOTAL CARCINOGEN</b>	C	0	0	0			
<b>TOTAL PAH</b>	108.5	2.6	4.6	4.6			
Dilution Factor							
Surrogate Recoveries	1	1	1	1			
Naphthalene-d8	72	72	80	74			
Fluorene-d10	57	62	57	54			
Chrysene-d12	71	67	78	73			



Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303 421-6611 Telephone  
303 431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

July 24, 1996

Quanterra Environmental Services

Project Number 049718

### Introduction

Nine aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on June 19, 1996. The samples were logged in under Quanterra Denver's project number 049718. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

### Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

Client sample with lab Id 049718-006 had to be diluted due to target analytes exceeding the linear range of the instrument. The reporting limits were raised accordingly. As a result of dilution the surrogates for sample 049718 were not detected and are reported as "D."

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By:

A handwritten signature in black ink, appearing to read "Kurt C. Ill".

Date:

A handwritten date in black ink, reading "July 24, 1996".

Kurt C. Ill  
Program Manager

Reviewed By:

A handwritten signature in black ink, appearing to read "John H. Lofftus".

Date:

A handwritten date in black ink, reading "7/25/96".

**QUALIFIER CODES AND THEIR USAGE**

- A = This flag indicates that a TIC is a suspected aldol-condensation product.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.
- C = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, the the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L:
- J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

**QUALIFIER CODES AND THEIR USAGE**  
**Page Two**

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

S = The concentration of this compound saturated the capacity of the detector and a valid quantitation could not be obtained at this dilution.

U = Indicates compound was analyzed for, but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.

X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".

R = Target compound's secondary ion confirmation not met, however peak shape and retention time make peak identification positive.

**ANALYTICAL TEST REQUESTS  
for  
City of St. Louis Park**

Lab ID: 049718	Group Code	Analysis Description	Custom Test?
0001 - 0007	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N
0002	B	Prep - PAH/SIM by GC/MS Low Level Polynuclear Aromatic Hydrocarbons, SIM Low Level	N

**SAMPLE DESCRIPTION INFORMATION**  
 for  
**City of St. Louis Park**

Lab ID	Client ID	Matrix	Sampled Date	Received Time	Received Date
049718-0001-SA	MSH-SLP11-061896	AQUEOUS	18 JUN 96		19 JUN 96
049718-0001-DU	MSH-SLP11D-061896	AQUEOUS	18 JUN 96		19 JUN 96
049718-0002-FB	MSH-SLP11FB-061896	AQUEOUS	18 JUN 96		19 JUN 96
049718-0002-FD	MSH-SLP11FBD-061896	AQUEOUS	18 JUN 96		19 JUN 96
049718-0003-SA	MSH-SLP13-061896	AQUEOUS	18 JUN 96		19 JUN 96
049718-0004-SA	MSH-SLP17-061896	AQUEOUS	18 JUN 96		19 JUN 96
049718-0005-SA	MSH-SLP12-061896	AQUEOUS	18 JUN 96		19 JUN 96
049718-0006-SA	GAC-SLP10F-061896	AQUEOUS	18 JUN 96		19 JUN 96
049718-0007-SA	GAC-SLP4F-061896	AQUEOUS	18 JUN 96		19 JUN 96

## **Chain of Custody Record**

044-41184-1







**Chain of Custody  
Record**

QUA-4124-1

Client

City of St. Louis Park  
3752 Wooddale Ave So  
St. Louis Park MN 55416

Address

City

Project Name

SAME  
Contract/Purchase Order/Quote No.

Project Manager

SCOTT ANDERSON

Telephone Number (Area Code)/Fax Number

924-2557 (612) 924-2570

Date

6-18-96

Environmental  
Services

Quanterra

Environmental  
Services

Chain Of Custody Number

75661

Page 3 of 4

Analysis (Attach list if  
more space is needed)

Special Instructions/  
Conditions of Receipt

49718

KST 06

KZ 07 07

Sample I.D. No. and Description  
(Containers for each sample may be combined on one line)

GAC-SLP10F-061896

GAC-SLP4F-061896

Date  
6-18-96

Time

Sample	Sed	Sol	Spans	HgSO4	HgCl3	HCl	NaOH	ZnAc2	NaOH
X									
X									

PPT PAH  
5  
200

Possible Hazard Identification

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Sample Disposal

Return To Client

Disposal By Lab

Archive For

(A fee may be assessed if samples are retained  
longer than 3 months)

Turn Around Time Required

24 Hours  48 Hours  7 Days  14 Days  21 Days  Other \_\_\_\_\_

1. Relinquished By

TJ ZK

Date

6-18-96 2:30

Time

1. Received By

K. ZAHLLab

Date

6/19/96 1130

Time

2. Relinquished By

Date

Time

2. Received By

QES,D

Date

Time

3. Relinquished By

Date

Time

3. Received By

Date

Time

<sup>1B</sup>  
**SEMICOLVATILE ORGANICS ANALYSIS DATA SHEET**

EPA SAMPLE NO.

MCQUANTERRA DENVER

**Contract:**

SLP11

Case No.: 49718   SAS No.: SDG No.: 49718  
Matrix: (soil/water) WATER   Lab Sample ID: 49718-01  
wt/vol: 4195 (g/ml) ML   Lab File ID: A0901348  
Concen: (low/med) LOW   Date Received: 06/19/96  
ture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/20/96  
ntrated Extract Volume: 0.5 (ml)   Date Analyzed: 07/19/96  
ction Volume: 1.0 (uL)   Dilution Factor: 1.0  
leanup: (Y/N) N   pH: 7.0

**CONCENTRATION UNITS:**  
(ug/L or ug/Kg) NG/L

271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	17	
95-13-6-----	1H-Indene	22	
91-20-3-----	Naphthalene	22	
95-15-8-----	Benzo(b)thiophene	10	
11-22-5-----	Quinoline	1.3	U
0-72-9-----	1H-Indole	2.4	U
-57-6-----	2-Methylnaphthalene	1.6	
90-12-0-----	1-Methylnaphthalene	5.0	
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	10	
132-64-9-----	Dibenzofuran	1.9	
86-73-7-----	Fluorene	3.1	
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	3.1	
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	3.1	
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP11D

Name: QUANTERRA DENVER Contract:

Code: Case No.: 49718 SAS No.: SDG No.: 49718

Ex: (soil/water) WATER Lab Sample ID: 49718-01DU

Sample wt/vol: 4195 (g/ml) ML Lab File ID: A1001349

Ex: (low/med) LOW Date Received: 06/19/96

Filter: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/20/96

Extracted Extract Volume: 0.5 (ml) Date Analyzed: 07/19/96

Reaction Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	U
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	18	_____
95-13-6-----	1H-Indene	24	_____
91-20-3-----	Naphthalene	24	_____
95-15-8-----	Benzo(b)thiophene	11	_____
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.1	_____
90-12-0-----	1-Methylnaphthalene	5.5	_____
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	11	_____
132-64-9-----	Dibenzofuran	2.2	_____
86-73-7-----	Fluorene	3.6	_____
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	3.5	_____
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	3.6	_____
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP11FB

Name: QUANTERRA DENVER	Contract:	
Code: Case No.: 49718	SAS No.:	SDG No.: 49718
six: (soil/water) WATER	Lab Sample ID: 49718-02FB	
ple wt/vol: 4185 (g/ml) ML	Lab File ID: A1101350	
al: (low/med) LOW	Date Received: 06/19/96	
cisture: _____ decanted: (Y/N) _____	Date Extracted: 06/20/96	
centrated Extract Volume: 0.5 (ml)	Date Analyzed: 07/19/96	
ection Volume: 1.0 (uL)	Dilution Factor: 1.0	
Cleanup: (Y/N) N	pH: 7.0	

CONCENTRATION UNITS:  
('ig/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND	UNITS	Q
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
1-57-6-----	2-Methylnaphthalene	2.5	U
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	0.96	U
86-73-7-----	Fluorene	0.96	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.6	U
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP11FBD

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 49718 SAS No.: SDG No.: 49718

Matrix: (soil/water) WATER Lab Sample ID: 49718-02FD

Sample wt/vol: 4185 (g/ml) ML Lab File ID: A1201351

Salinity: (low/med) LOW Date Received: 06/19/96

Distilled: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/20/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/19/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	1.6 U
95-13-6-----	1H-Indene	0.86 U
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	2.9 U
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	0.96 U
86-73-7-----	Fluorene	0.96 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	1.4 U
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)Fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cc)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP13

Name: QUANTERRA DENVER

Contract:

Case No.: 49718 SAS No.: SDG No.: 49718

ix: (soil/water) WATER Lab Sample ID: 49718-03

ile wt/vol: 4200 (g/ml) ML Lab File ID: A1301352

l: (low/med) LOW Date Received: 06/19/96

isture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/20/96

:ntrated Extract Volume: 0.5 (ml) Date Analyzed: 07/19/96

ction Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND			Q
271-89-6-----	2,3-Benzofuran	4.8	U	
496-11-7-----	2,3-Dihydroindene	1.4	U	
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
1-57-6-----	2-Methylnaphthalene	1.8	U	
0-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.95	U	
86-73-7-----	Fluorene	0.95	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	1.4	U	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

3: QUANTERRA DENVER

Contract:

SLP12

3: Case No.: 49718 SAS No.: SDG No.: 49718  
 (soil/water) WATER Lab Sample ID: 49718-05  
 wt/vol: 4190 (g/ml) ML Lab File ID: A1501354  
 (low/med) LOW Date Received: 06/19/96  
 sure: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/20/96  
 Crated Extract Volume: 0.5 (ml) Date Analyzed: 07/19/96  
 ion Volume: 1.0 (uL) Dilution Factor: 1.0  
 sanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: 'ug/L or ug/Kg)	Q
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	1.2	U
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorene	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.4	U
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)Fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP17

Name: QUANTERRA DENVER

Contract:

Date:

Case No.: 49718 SAS No.: SDG No.: 49718

ix: (soil/water) WATER

Lab Sample ID: 49718-04

le wt/vol: 4200 (g/ml) ML

Lab File ID: A1401353

l: (low/med) LOW

Date Received: 06/19/96

isture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/20/96

ntrated Extract Volume: 0.5(ml)

Date Analyzed: 07/19/96

ction Volume: 1.0(uL)

Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND		
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
1157-6-----	2-Methylnaphthalene	2.3	U
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorene	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	2.3	U
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

a: QUANTERRA DENVER

Contract:

SLP12

a: Case No.: 49718 SAS No.: SDG No.: 49718

(soil/water) WATER Lab Sample ID: 49718-05

wt/vol: 4190 (g/ml) ML Lab File ID: A1501354

(low/med) LOW Date Received: 06/19/96

ture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/20/96

:rated Extract Volume: 0.5 (ml) Date Analyzed: 07/19/96

ion Volume: 1.0 (uL) Dilution Factor: 1.0

eanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND		Q
271-89-6-----	2, 3-Benzofuran	4.9	U
496-11-7-----	2, 3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	1.2	U
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorene	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.4	U
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

ib Name: QUANTERRA DENVER

Contract:

ib de:

Case No.: 49718

SAS No.:

SDG No.: 49718

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	SBLK01	86	88	71						0
02	LCS	86	90	76						0
03	SLP11	72	57	71						0
04	SLP11D	80	57	80						0
05	SLP11FB	75	81	72						0
06	SLP11FBD	80	99	71						0
07	SLP13	80	57	78						0
08	SLP17	74	54	73						0
09	SLP12	72	62	67						0
10	SLP4F	68	47	65						0
11	SLP10F	OD	OD	OD						0
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

**FORM 3**  
**WATER SEMIVOLATILE METHOD SPIKE RECOVERY**

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 49718 SAS No.: SDG No.: 49718

Spike - Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
Indene	10	6.8	68	20-150
Phthalene	10	9.4	94	20-150
Toluene	10	9.9	99	20-150
Methylnaphthalene	10	8.9	89	20-150
Styrene	10	8.3	83	69-118
Pyrene	10	6.6	66	20-132
Azo(e)pyrene	10	9.4	94	20-150

Column to be used to flag recovery and RPD values with an asterisk  
values outside of QC limits

MENTS: \_\_\_\_\_

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LCS

Name: QUANTERRA DENVER

Contract:

Case No.: 49718      SAS No.: SDG No.: 49718  
Matrix: (soil/water) WATER      Lab Sample ID: 49718-LCS  
Sample wt/vol: 4000 (g/ml) ML      Lab File ID: A0801347  
Level: (low/med) LOW      Date Received: \_\_\_\_\_  
Distillation: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/20/96  
Extracted Extract Volume: 0.5 (ml)      Date Analyzed: 07/19/96  
Dilution Volume: 1.0 (uL)      Dilution Factor: 1.0  
Cleanup: (Y/N) N      pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
95-13-6-----	1H-Indene	6.8
91-20-3-----	Naphthalene	9.4
91-22-5-----	Quinoline	9.9
91-57-6-----	2-Methylnaphthalene	8.9
86-73-7-----	Fluorene	8.3
218-01-9-----	Chrysene	6.6
192-97-2-----	Benz(e)pyrene	9.4

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Name: QUANTERRA DENVER

Contract:

Date: Case No.: 49718

SAS No.:

SDG No.: 49718

File ID: A0701346

Lab Sample ID: SBLK01

Instrument ID: A

Date Extracted: 06/20/96

Type: (soil/water) WATER

Date Analyzed: 07/19/96

: (low/med) LOW

Time Analyzed: 1349

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	49718-LCS	A0801347	07/19/96
02 SLP11	49718-01	A0901348	07/19/96
03 SLP11D	49718-01DU	A1001349	07/19/96
04 SLP11FB	49718-02FB	A1101350	07/19/96
05 SLP11FBD	49718-02FD	A1201351	07/19/96
06 SLP13	49718-03	A1301352	07/19/96
07 SLP17	49718-04	A1401353	07/19/96
08 SLP12	49718-05	A1501354	07/19/96
09 SLP4F	49718-07	A1701356	07/19/96
10 SLP10F	49718-06	A0201359	07/22/96
11			
12			
13			
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16			
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23			
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29			
30			

MENTS:

. of 1

FORM IV SV

3/90

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Name: QUANTERRA DENVER

Contract:

SBLK01

Case No.: 49718      SAS No.: SDG No.: 49718  
 : (soil/water) WATER      Lab Sample ID: SBLK01  
 le wt/vol: 4000 (g/ml) ML      Lab File ID: A0701346  
 : (low/med) LOW      Date Received: \_\_\_\_\_  
 isture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/20/96  
 antrated Extract Volume: 0.5 (ml)      Date Analyzed: 07/19/96  
 ction Volume: 1.0 (uL)      Dilution Factor: 1.0  
 Cleanup: (Y/N) N      pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	
271-89-6-----	2, 3-Benzofuran	5.1	U
496-11-7-----	2, 3-Dihydroindene	1.4	U
95-13-6-----	1H-Indene	0.90	U
91-20-3-----	Naphthalene	6.5	U
95-15-8-----	Benzo(b)thiophene	0.90	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.5	U
11-57-6-----	2-Methylnaphthalene	0.90	U
0-12-0-----	1-Methylnaphthalene	1.6	U
92-52-4-----	Biphenyl	4.3	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	1.0	U
86-73-7-----	Fluorene	1.0	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	1.3	U
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.9	U
86-74-8-----	Carbazole	1.9	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.5	U
218-01-9-----	Chrysene	2.8	U
207-08-9-----	Benzo(b)fluoranthene	2.5	U
205-08-9-----	Benzo(k)fluoranthene	2.3	U
192-97-2-----	Benzo(e)pyrene	1.9	U
50-32-8-----	Benzo(a)pyrene	2.3	U
198-55-0-----	Perylene	2.5	U
193-39-5-----	Indeno(1, 2, 3-cd)pyrene	2.1	U
53-70-3-----	Dibenzo(a, h)anthracene	1.6	U
191-24-2-----	Benzo(g, h, i)perylene	2.8	U

88

## SEMICOLVATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA · DENVER

### **Contract:**

**Code:** Case No.: 49718 SAS No.: SDG No.: 49718

Case No.: 49718 SAS No.:

SDG No.: 49718

File ID (Standard) : A339

Date Analyzed: 07/19/96

### **Instrument D: A**

Time Analyzed: 0925

IS1 (ANT) = Acenaphthene-d10

IS2 (PEN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d<sub>12</sub>

**AREA UPPER LIMIT** = +100% of internal standard area

**AREA LOWER LIMIT = - 50% of internal standard area**

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

8B

## SEMICVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

me: QUANTERRA DENVER

**Contract:**

File ID (Standard): A0357

Date Analyzed: 07/22/96

gment ID: A

Time Analyzed: 1820

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
AREA LOWER LIMIT = - 50% of internal standard area  
RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

. of 1

**FORM VIII SV-1**

3 / 90

**2C**  
**WATER SEMIVOLATILE SURROGATE RECOVERY**

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 49718

SAS No.:

SDG No.: 49718

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
1	SBLK01	86	88	71						0
2	LCS	86	90	76						0
3	SLP11	72	57	71						0
4	SLP11D	80	57	80						0
5	SLP11FB	75	81	72						0
6	SLP11FBD	80	99	71						0
7	SLP13	80	57	78						0
8	SLP17	74	54	73						0
9	SLP12	72	62	67						0
10	SLP4F	68	47	65						0
11	SLP10F	OD	OD	OD						0
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

**FORM 3**  
**WATER SEMIVOLATILE METHOD SPIKE RECOVERY**

Name: QUANTERRA DENVER

Contract:

Q

Case No.: 49718      SAS No.:

SDG No.: 49718

Spike - Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
Indene	10	6.8	68	20-150
naphthalene	10	9.4	94	20-150
aniline	10	9.9	99	20-150
4-methylnaphthalene	10	8.9	89	20-150
o-xylene	10	8.3	83	69-118
cyclohexene	10	6.6	66	20-132
iso(e)pyrene	10	9.4	94	20-150

Column to be used to flag recovery and RPD values with an asterisk  
values outside of QC limits

MENTS: \_\_\_\_\_

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Name: QUANTERRA DENVER	Contract:	
Code: Case No.: 49718	SAS No.:	SDG No.: 49718
File ID: A0701346	Lab Sample ID: SBLK01	
Instrument ID: A	Date Extracted: 06/20/96	
Matrix: (soil/water) WATER	Date Analyzed: 07/19/96	
Rel: (low/med) LOW	Time Analyzed: 1349	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	49718-LCS	A0801347	07/19/96
02 SLP11	49718-01	A0901348	07/19/96
03 SLP11D	49718-01DU	A1001349	07/19/96
04 SLP11FB	49718-02FB	A1101350	07/19/96
05 SLP11FBD	49718-02FD	A1201351	07/19/96
06 SLP13	49718-03	A1301352	07/19/96
07 SLP17	49718-04	A1401353	07/19/96
08 SLP12	49718-05	A1501354	07/19/96
09 SLP4F	49718-07	A1701356	07/19/96
10 SLP10F	49718-06	A0201359	07/22/96
11			
12			
13			
14			
15			
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27			
28			
29			
30			

COMMENTS:

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8B  
SEMOVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Code: Case No.: 49718 SAS No.: SDG No.: 49718

Lab File ID (Standard): A339

Date Analyzed: 07/19/96

Instrument ID: A

Time Analyzed: 0925

	IS1 (ANT) AREA #	RT #	IS2 (PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	92011	12.14	153973	14.54	97182	21.14
UPPER LIMIT	184022	12.64	307946	15.04	194364	21.64
LOWER LIMIT	46006	11.64	76986	14.04	48591	20.64
EPA SAMPLE NO.						
01 SBLK01	94965	12.14	164403	14.54	98011	21.14
02 LCS	98630	12.14	203016	14.53	117995	21.14
03 SLP11	103072	12.14	209666	14.54	130776	21.14
04 SLP11D	109914	12.14	196405	14.53	134623	21.14
05 SLP11FB	108525	12.14	181724	14.53	125837	21.14
06 SLP11FBD	108609	12.14	200508	14.54	109348	21.14
07 SLP13	105769	12.14	192942	14.54	140650	21.14
08 SLP17	111180	12.14	202285	14.54	150827	21.14
09 SLP12	119830	12.13	236986	14.54	145005	21.15
10 SLP4F	120250	12.14	208924	14.54	145071	21.14
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49718

SAS No.:

SDG No.: 49718

Lab File ID (Standard): A0357

Date Analyzed: 07/22/96

Instrument ID: A

Time Analyzed: 1820

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	84032	12.14	134938	14.53	74173	21.14
UPPER LIMIT	168064	12.64	269876	15.03	148346	21.64
LOWER LIMIT	42016	11.64	67469	14.03	37086	20.64
EPA SAMPLE NO.						
01 SLP10F	103512	12.13	180255	14.53	107030	21.13
02						
03						
04						
05						
06						
07						
08						
09						
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18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

**APPENDIX B  
LABORATORY DATA SUMMARY PACKAGE:  
IRONTON - GALESVILLE AQUIFER**

**WELL  
W105**

# CITY OF ST. LOUIS PARK

## Ironton Galesville Aquifer 1996 PAH Quality Control Summary

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Matrix Spike Dup.	Field Blank
----------	-------------	--------------	-----------------	--------------	-------------------	-------------

### RAP Section 6.2.1

W105	5/21/96	SBLK01-052196	IGV-W105D-052196	STP-W410MS-052096	STP-W410MSD-052096	IGV-W105FB-052196

**CITY OF ST. LOUIS PARK**  
**Ironton Galesville Aquifer**  
**Analytical Result Summary**  
**1996**

Well	Coordinates	Recording Date	Water Level	PAH Concentrations			<i>ng/L</i>	<i>ug/L</i>
				B(a)P	D(a,h)A	Carcin		
W 105	896.83							
	2163212	5/21/96	786.20			29	2,746	
	707917							





Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303 421-6611 Telephone  
303 431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

July 8, 1996

Quanterra Environmental Services

Project Number 049190

### Introduction

Eight aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on May 22, 1996. The samples were logged in under Quanterra Denver's project number 049190. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

### Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

Client samples with lab Id's 049190-003, 003DU, 005, 006 and 007 had to be diluted due to target analytes exceeding the linear range of the instrument. The reporting limits were raised accordingly. As a result of dilution the surrogates for sample 049190-006 were not detected and are reported as "D."

The surrogate fluorene-d10 in client sample W105 is reported at 33% recovery which is outside the 41% to 162% acceptance criteria. Chrysene-d12 in both the laboratory blank and DCSSs are reported within acceptable limits. This would suggest a matrix effect and a possible low bias to the sample results

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

**Reported By:** Kurt C. III **Date:** 7/8/96  
Kurt C. III  
Program Manager

**Reviewed By:** Mark A. Smith **Date:** 7/8/96

**ANALYTICAL TEST REQUESTS  
for  
City of St. Louis Park**

Lab ID: 049190	Group Code	Analysis Description	Custom Test?
0001 - 0007	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N
0004	B	Prep - PAH/SIM by GC/MS Low Level	N

## ***Chain of Custody***

## *Record*

QUA-4124-1

**Quanterra**  
Environmental  
Services

**Environmental  
Services**

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**DISTRIBUTION:**

**- Stays with the Sample: CANARY - Returned to Client with Report: PINK - Filed**

In G 10 80002

303-421-6611 Telephone  
303-431-7171 Fax

QUANTERRA CLIENT

PROJECT

SAMPLING COMPANY

SAMPLING SITE

TEAM LEADER

DATE

TIME

DATE

998 Yarrow Street  
Arvada, Colorado 80002

303-421-6611 Telephone,  
303-431-7171 Fax

Environmental  
Services

QUANTERRA CLIENT

PROJECT

SAMPLING COMPANY

SAMPLING SITE

TRANSPORTER

TRANSPORTER

DATE

TIME

City of St. Louis Park  
3752 Wooddale Ave So  
St. Louis Park MN 55416

John P. [Signature]

Project Manager

RECEIVED FOR ANALYSIS SAMPLES CONDITIONS		SEAL NUMBER
RECEIVED FOR ANALYSIS SAMPLES CONDITIONS		CONDITION OF CONTENTS
RECEIVED FOR ANALYSIS SAMPLES CONDITIONS		INITIAL CONTENTS TEMP
RECEIVED FOR ANALYSIS SAMPLES CONDITIONS		CONTENTS TEMPERATURE UPON RECEIPT BY LAB

SAMPLE NUMBER	SAMPLING STATUS	REMARKS
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SAMPLE NUMBER	SAMPLING STATUS	REMARKS
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SAMPLE NUMBER	SAMPLING STATUS	REMARKS
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SAMPLE NUMBER	SAMPLING STATUS	REMARKS
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SAMPLE NUMBER	SAMPLING STATUS	REMARKS
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SAMPLE NUMBER	SAMPLING STATUS	REMARKS
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SAMPLE NUMBER	SAMPLING STATUS	REMARKS
---------------	-----------------	---------

### CUSTODY TRANSFER TO SHIPPING

### RECEIVED BY (SIGNED) DATE TIME SHIP TO ADDRESS DATE/TIME

RECEIVED BY (SIGNED) DATE TIME SHIP TO ADDRESS DATE/TIME

RECEIVED BY (SIGNED) DATE TIME SHIP TO ADDRESS DATE/TIME

RECEIVED BY (SIGNED) DATE TIME SHIP TO ADDRESS DATE/TIME

AIRBILL NUMBER  
DATE/TIME

7223345678  
8/22/98 9:15

8:15 AM

## **Chain of Record**

QIA-1124-1

---

**Client**

*Environmental  
Services*

**DISTRIBUTION:** WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

DPV - SPT  
IGV -



SAMPLE DESCRIPTION INFORMATION  
for  
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
049190-0001-SA	DPV-W131-052196	AQUEOUS	21 MAY 96	11:40	22 MAY 96
049190-0002-SA	DPV-W424-052196	AQUEOUS	21 MAY 96	13:40	22 MAY 96
049190-0003-SA	IGV-W105-052196	AQUEOUS	21 MAY 96		22 MAY 96
049190-0003-DU	IGV-W105D-052196	AQUEOUS	21 MAY 96		22 MAY 96
049190-0004-FB	IGV-W105FB-052196	AQUEOUS	21 MAY 96		22 MAY 96
049190-0004-FD	IGV-W105FBD-052196	AQUEOUS	21 MAY 96		22 MAY 96
049190-0005-SA	DPV-W20-052196	AQUEOUS	21 MAY 96	08:30	22 MAY 96
049190-0006-SA	DPV-W101-052196	AQUEOUS	21 MAY 96	09:20	22 MAY 96
049190-0007-SA	DPV-W428-052196	AQUEOUS	21 MAY 96	10:45	22 MAY 96

**1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET**

EPA SAMPLE NO.

W105

Lab Name: QUANTERRA DENVER Contract:

Lab Code: Case No.: 49190 SAS No.: SDG No.: 49190

Matrix: (soil/water) WATER Lab Sample ID: 49190-03

Sample wt/vol: 4217 (g/ml) ML Lab File ID: A1501193

Level: (low/med) LOW Date Received: 05/22/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 05/27/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 06/28/96

Injection Volume: 1.0 (uL) Dilution Factor: 10.0

PC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	48	U	
496-11-7-----	2,3-Dihydroindene	90		
95-13-6-----	1H-Indene	38		
91-20-3-----	Naphthalene	400		
95-15-8-----	Benzo(b)thiophene	33		
91-22-5-----	Quinoline	13	U	
120-72-9-----	1H-Indole	24	U	
91-57-6-----	2-Methylnaphthalene	88	B	
90-12-0-----	1-Methylnaphthalene	93		
92-52-4-----	Biphenyl	68		
208-96-8-----	Acenaphthylene	32		
83-32-9-----	Acenaphthene	200		
132-64-9-----	Dibenzofuran	80		
86-73-7-----	Fluorene	150		
132-65-0-----	Dibenzothiophene	28		
85-01-8-----	Phenanthrene	300	B	
120-12-7-----	Anthracene	34		
260-94-6-----	Acridine	28	U	
86-74-8-----	Carbazole	42		
206-44-0-----	Fluoranthene	360		
129-00-0-----	Pyrene	300		
56-55-3-----	Benzo(a)Anthracene	29		
218-01-9-----	Chrysene	26	U	
207-08-9-----	Benzo(b)fluoranthene	24	U	
205-08-9-----	Benzo(k)fluoranthene	22	U	
192-97-2-----	Benzo(e)pyrene	18	U	
50-32-8-----	Benzo(a)pyrene	22	U	
198-55-0-----	Perylene	24	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	20	U	
53-70-3-----	Dibenzo(a,h)anthracene	15	U	
191-24-2-----	Benzo(g,h,i)perylene	26	U	

**1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

W105D

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 49190 SAS No.: SDG No.: 49190

Matrix: (soil/water) WATER Lab Sample ID: 49190-03DU

Sample wt/vol: 4214 (g/ml) ML Lab File ID: A1601194

Level: (low/med) LOW Date Received: 05/22/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 05/27/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 06/28/96

Injection Volume: 1.0 (uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	48	U	
496-11-7-----	2,3-Dihydroindene	110		
95-13-6-----	1H-Indene	42		
91-20-3-----	Naphthalene	460		
95-15-8-----	Benzo(b)thiophene	40		
91-22-5-----	Quinoline	13	U	
120-72-9-----	1H-Indole	24	U	
91-57-6-----	2-Methylnaphthalene	99	B	
90-12-0-----	1-Methylnaphthalene	100		
92-52-4-----	Biphenyl	84		
208-96-8-----	Acenaphthylene	37		
83-32-9-----	Acenaphthene	240		
132-64-9-----	Dibenzofuran	94		
86-73-7-----	Fluorene	190		
132-65-0-----	Dibenzothiophene	36		
85-01-8-----	Phenanthrene	360	B	
120-12-7-----	Anthracene	38		
260-94-6-----	Acridine	28	U	
86-74-8-----	Carbazole	46		
206-44-0-----	Fluoranthene	410		
129-00-0-----	Pyrene	360		
56-55-3-----	Benzo(a)Anthracene	29		
218-01-9-----	Chrysene	26	U	
207-08-9-----	Benzo(b)fluoranthene	24	U	
205-08-9-----	Benzo(k)fluoranthene	22	U	
192-97-2-----	Benzo(e)pyrene	18	U	
50-32-8-----	Benzo(a)pyrene	22	U	
198-55-0-----	Perylene	24	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	20	U	
53-70-3-----	Dibenzo(a,h)anthracene	15	U	
191-24-2-----	Benzo(g,h,i)perylene	26	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

W105FB

Lab Name: QUANTERRA DENVER Contract:

Lab Sample ID: 49190-04FB

ab Code: Case No.: 49190 SAS No.: SDG No.: 49190

atrix: (soil/water) WATER Lab File ID: A1101189

ample wt/vol: 4174 (g/ml) ML Date Received: 05/22/96

evel: (low/med) LOW Date Extracted: 05/27/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Analyzed: 06/28/96

concentrated Extract Volume: 0.5 (ml) Dilution Factor: 1.0

njection Volume: 1.0 (uL)

PC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	2.4	_____
95-13-6-----	1H-Indene	0.90	_____
91-20-3-----	Naphthalene	8.9	_____
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	4.4	B
90-12-0-----	1-Methylnaphthalene	2.1	_____
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	0.96	U
86-73-7-----	Fluorene	0.96	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	2.2	B
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

**1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**W105FBD**

Lab Name: QUANTERRA DENVER	Contract:	
Lab Code: Case No.: 49190	SAS No.:	SDG No.: 49190
Matrix: (soil/water) WATER	Lab Sample ID: 49190-04FD	
Sample wt/vol: 4194 (g/ml) ML	Lab File ID: A1201190	
Level: (low/med) LOW	Date Received: 05/22/96	
Moisture: _____	Date Extracted: 05/27/96	
Concentrated Extract Volume: 0.5 (ml)	Date Analyzed: 06/28/96	
Injection Volume: 1.0 (uL)	Dilution Factor: 1.0	
C Cleanup: (Y/N) N	pH: 7.0	

**CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L**

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	4.4
95-13-6-----	1H-Indene	1.0 R
91-20-3-----	Naphthalene	9.8
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	6.0 B
90-12-0-----	1-Methylnaphthalene	2.6
92-52-4-----	Biphenyl	4.1 U
203-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	0.95 U
86-73-7-----	Fluorene	0.95 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	1.6 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

**2C**  
**WATER SEMIVOLATILE SURROGATE RECOVERY**

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49190 SAS No.:

SDG No.: 49190

EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01 SBLK01	97	103	76						0
02 49190-DCS1	84	98	66						0
03 49190-DCS2	88	99	72						0
04 W20	61	51	53						0
05 W131	52	18	51						0
06 W424	54	14	53						0
07 W105FB	75	104	63						0
08 W105FBD	76	93	62						0
09 W101	OD	OD	OD						0
10 W428	40	14	45						0
11 W105	67	112	33*						0
12 W105D	79	84	41						0
13									
14									
15									
16									
17									
18									
22									
23									
24									
25									
26									
27									
28									
29									
30									

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

**1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET**

EPA SAMPLE NO.

**49190-DCS1**

Lab Name: QUANTERRA DENVER Contract:

Lab Code: Case No.: 49190 SAS No.: SDG No.: 49190

Matrix: (soil/water) WATER Lab Sample ID: 49190-DCS1

Sample wt/vol: 4000 (g/ml) ML Lab File ID: A0201180

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 05/27/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 06/28/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	Q
95-13-6-----	1H-Indene	58	
91-20-3-----	Naphthalene	65	
91-22-5-----	Quinoline	75	
91-57-6-----	2-Methylnaphthalene	61	
86-73-7-----	Fluorene	63	
218-01-9-----	Chrysene	59	
192-97-2-----	Benzo(e)pyrene	64	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

49190-DCS2

Lab Code: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 49190 SAS No.: SDG No.: 49190

Matrix: (soil/water) WATER Lab Sample ID: 49190-DCS2

Sample wt/vol: 4000 (g/ml) ML Lab File ID: A0301181

Level: (low/med) LOW Date Received: \_\_\_\_\_

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 05/27/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 06/28/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

HPLC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
95-13-6-----	1H-Indene	63	
91-20-3-----	Naphthalene	70	
91-22-5-----	Quinoline	81	
91-57-6-----	2-Methylnaphthalene	66	
86-73-7-----	Fluorene	68	
218-01-9-----	Chrysene	60	
192-97-2-----	Benzo(e)pyrene	63	

**1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**SBLK01**

Lab Name: QUANTERRA DENVER Contract:

Lab Code: Case No.: 49190 SAS No.: SDG No.: 49190

Matrix: (soil/water) WATER Lab Sample ID: SBLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: A0101179

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 05/27/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 06/28/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	Q
271-89-6-----	2,3-Benzofuran	5.1	U
496-11-7-----	2,3-Dihydroindene	1.4	U
95-13-6-----	1H-Indene	0.90	U
91-20-3-----	Naphthalene	6.5	U
95-15-8-----	Benzo(b)thiophene	0.90	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.5	U
91-57-6-----	2-Methylnaphthalene	1.2	U
90-12-0-----	1-Methylnaphthalene	1.6	U
92-52-4-----	Biphenyl	4.3	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	1.0	U
86-73-7-----	Fluorene	1.0	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	1.8	U
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.9	U
86-74-8-----	Carbazole	1.9	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.5	U
218-01-9-----	Chrysene	2.8	U
207-08-9-----	Benzo(b)fluoranthene	2.5	U
205-08-9-----	Benzo(k)fluoranthene	2.3	U
192-97-2-----	Benzo(e)pyrene	1.9	U
50-32-8-----	Benzo(a)pyrene	2.3	U
198-55-0-----	Perylene	2.5	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.8	U

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01
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L Name: QUANTERRA DENVER

Contract:

L Code: Case No.: 49190 SAS No.: SDG No.: 49190

Lab File ID: A0101179 Lab Sample ID: SBLK01

Instrument ID: A Date Extracted: 05/27/96

Matrix: (soil/water) WATER Date Analyzed: 06/28/96

Level: (low/med) LOW Time Analyzed: 0925

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 49190-DCS1	49190-DCS1	A0201180	06/28/96
02 49190-DCS2	49190-DCS2	A0301181	06/28/96
03 W10	49190-05	A0401182	06/28/96
04 W131	49190-01	A0701185	06/28/96
05 W424	49190-02	A0801186	06/28/96
06 W105FB	49190-04FB	A1101189	06/28/96
07 W105FBD	49190-04FD	A1201190	06/28/96
08 W101	49190-06	A1301191	06/28/96
09 W428	49190-07	A1401192	06/28/96
10 W105	49190-03	A1501193	06/28/96
11 W105D	49190-03DU	A1601194	06/28/96
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COMMENTS:

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8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49190

SAS No.:

SDG No.: 49190

Lab File ID (Standard): A178

Date Analyzed: 06/28/96

Instrument ID: A

Time Analyzed: 0831

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	100295	12.43	127092	14.86	50608	21.46
UPPER LIMIT	200590	12.93	254184	15.36	101216	21.96
LOWER LIMIT	50148	11.93	63546	14.36	25304	20.96
EPA SAMPLE NO.						
01 SBLK01	81681	12.43	120805	14.85	40868	21.46
02 49190-DCS1	89063	12.41	119047	14.84	49134	21.45
03 49190-DCS2	91367	12.41	117669	14.84	47586	21.45
04 W20	123403	12.41	180127	14.84	64445	21.44
05 W131	119706	12.41	170144	14.84	83829	21.46
06 W424	117662	12.41	151379	14.84	84984	21.45
07 W105FB	102044	12.41	137442	14.83	43570	21.45
08 W105FBD	94878	12.41	131001	14.84	45329	21.45
09 W101	88293	12.41	105442	14.84	34672	21.45
10 W428	114614	12.40	153512	14.83	74000	21.45
11 W105	159138	12.40	194852	14.84	40996	21.44
12 W105D	122152	12.40	156117	14.83	38153	21.45
13						
14						
15						
16						
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18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

lb e: QUANTERRA DENVER

Contract:

lb Code:

Case No.: 49190 SAS No.:

SDG No.: 49190

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	SBLK01	97	103	76						0
02	49190-DCS1	84	98	66						0
03	49190-DCS2	88	99	72						0
04	W20	61	51	53						0
05	W131	52	18	51						0
06	W424	54	14	53						0
07	W105FB	75	104	63						0
08	W105FBD	76	93	62						0
09	W101	OD	OD	OD						0
10	W428	40	14	45						0
11	W105	67	112	33*						0
12	W105D	79	84	41						0
13										
14										
15										
16										
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19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Lab Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 49190

SAS No.:

SDG No.: 49190

File ID: A0101179

Lab Sample ID: SBLK01

Instrument ID: A

Date Extracted: 05/27/96

Matrix: (soil/water) WATER

Date Analyzed: 06/28/96

Level: (low/med) LOW

Time Analyzed: 0925

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 49190-DCS1	49190-DCS1	A0201180	06/28/96
02 49190-DCS2	49190-DCS2	A0301181	06/28/96
03 W20	49190-05	A0401182	06/28/96
04 W131	49190-01	A0701185	06/28/96
05 W424	49190-02	A0801186	06/28/96
06 W105FB	49190-04FB	A1101189	06/28/96
07 W105FBD	49190-04FD	A1201190	06/28/96
08 W101	49190-06	A1301191	06/28/96
09 W428	49190-07	A1401192	06/28/96
10 W105	49190-03	A1501193	06/28/96
11 W105D	49190-03DU	A1601194	06/28/96
12			
13			
14			
15			
16			
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MENTS:

1 of 1

FORM IV SV

3/90

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 49190 SAS No.: SDG No.: 49190

Lab File ID (Standard): A178

Date Analyzed: 06/28/96

Instrument ID: A

Time Analyzed: 0831

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	100295	12.43	127092	14.86	50608	21.46
UPPER LIMIT	200590	12.93	254184	15.36	101216	21.96
LOWER LIMIT	50148	11.93	63546	14.36	25304	20.96
EPA SAMPLE NO.						
01 SBLK01	81681	12.43	120805	14.85	40868	21.46
02 49190-DCS1	89063	12.41	119047	14.84	49134	21.45
03 49190-DCS2	91367	12.41	117669	14.84	47586	21.45
04 W20	123403	12.41	180127	14.84	64445	21.44
05 W131	119706	12.41	170144	14.84	83829	21.46
06 W424	117662	12.41	151379	14.84	84984	21.45
07 W105FB	102044	12.41	137442	14.83	43570	21.45
08 W105FBD	94878	12.41	131001	14.84	45329	21.45
09 W101	88293	12.41	105442	14.84	34672	21.45
10 W428	114614	12.40	153512	14.83	74000	21.45
11 W105	159138	12.40	194852	14.84	40996	21.44
12 W105D	122152	12.40	156117	14.83	38153	21.45
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

**APPENDIX C  
LABORATORY DATA SUMMARY PACKAGE:  
PRAIRIE DU CHIEN - JORDAN AQUIFER**

**WELLS**

SLP4 SLP5 SLP6 SLP7 SLP8 SLP9  
SLP10 SLP14 SLP15 SLP16  
E2 E3 E4 E7 E13 E15 H6 MTK6  
W23 W29 W32 W40 W48 W70  
W119 W401 W402 W403 W406

# CITY OF ST. LOUIS PARK

## Prairie du Chien Jordan Aquifer 1996 PAH Quality Control Summary

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Matrix Spike Dup.	Field Blank
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### RAP Section 7.3 (A)

SLP4	6/4/96	SBLK01-49403	PCJ-SLP4D-060496	STP-SLP3MS-060396	STP-SLP3MSD-060396	PCJ-SLP4FB-060496
SLP4	9/30/96	SBLK01-51769	PCJ-SLP4D-093096	PCJ-SLP4MS-093096	PCJ-SLP4MSD-093096	PCJ-SLP4FB-093096

### Phenolics Quality Control Summary

SLP4	4/15/96	PBLK-48335	DPV-W420TPD-041596	DPV-W420TPMS-041596	DPV-W420TPMSD-041596	DPV-W420TPFB-041596
SLP4	7/15/96	ICBLK-50225	DPV-W420TPD-071596	DPV-W420TPMS-071596	DPV-W420TPMSD-071596	DPV-W420TPFB-071596

### RAP Section 7.3 (B)

W23	4/15/96	SBLK01-48342	DPV-W420D-041596	DPV-W420MS-041596	DPV-W420MSD-041596	DPV-W420FB-041596
W23	7/15/96	SBLK01-50226	DPV-W420D-071696	DPV-W420MS-071696	DPV-W420MSD-071696	DPV-W420FB-071696

### RAP Section 7.3 (C)

SLP6	6/4/96	SBLK01-49403	PCJ-SLP4D-060496	STP-SLP3MS-060396	STP-SLP3MSD-060396	PCJ-SLP4FB-060496
SLP7	6/4/96	SBLK01-49403	PCJ-SLP4D-060496	STP-SLP3MS-060396	STP-SLP3MSD-060396	PCJ-SLP4FB-060496

### RAP Section 7.3 (D)

SLP10	6/10/96	SBLK01-49501	PCJ-SLP10D-061096	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP10FB-061096
W402	6/4/96	SBLK01-49403	PCJ-SLP4D-060496	STP-SLP3MS-060396	STP-SLP3MSD-060396	PCJ-SLP4FB-060496
W403	6/4/96	SBLK01-49403	PCJ-SLP4D-060496	STP-SLP3MS-060396	STP-SLP3MSD-060396	PCJ-SLP4FB-060496
W406	6/4/96	SBLK01-49403	PCJ-SLP4D-060496	STP-SLP3MS-060396	STP-SLP3MSD-060396	PCJ-SLP4FB-060496
H3		Abandoned				
SLP14	6/11/96	SBLK01-49534	PCJ-SLP14D-061196	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP14FB-061196
SLP16	6/17/96	SBLK01-49697	PCJ-SLP16D-061796	PCJ-SLP16MS-061796	PCJ-SLP16MSD-061796	PCJ-SLP16FB-061796
W119		NOT AVAILABLE TO SAMPLE				

# CITY OF ST. LOUIS PARK

## Prairie du Chien Jordan Aquifer 1996 PAH Quality Control Summary

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Matrix Spike Dup.	Field Blank
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### RAP Section 7.3(E)

SLP5	NOT AVAILABLE TO SAMPLE					
W40	6/10/96	SBLK01-49501	PCJ-SLP10D-061096	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP10FB-061096
E3	6/11/96	SBLK01-49534	PCJ-SLP14D-061196	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP14FB-061196
H6	6/17/96	SBLK01-49697	PCJ-SLP16D-061796	PCJ-SLP16MS-061796	PCJ-SLP16MSD-061796	PCJ-SLP16FB-061796
W70	6/10/96	SBLK01-49501	PCJ-SLP10D-061096	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP10FB-061096
MTK6	6/17/96	SBLK01-49697	PCJ-SLP16D-061796	PCJ-SLP16MS-061796	PCJ-SLP16MSD-061796	PCJ-SLP16FB-061796
W29	6/10/96	SBLK01-49501	PCJ-SLP10D-061096	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP10FB-061096

# CITY OF ST. LOUIS PARK

## Prairie du Chien Jordan Aquifer 1996 PAH Quality Control Summary

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Matrix Spike Dup.	Field Blank
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### RAP Section 7.4.1 1st HALF

W48	6/17/96	SBLK01-49697	PCJ-SLP16D-061796	PCJ-SLP16MS-061796	PCJ-SLP16MSD-061796	PCJ-SLP16FB-061796
W401	6/11/96	SBLK01-49534	PCJ-SLP14D-061196	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP14FB-061196
E2	6/11/96	SBLK01-49534	PCJ-SLP14D-061196	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP14FB-061196
E7	6/11/96	SBLK01-49534	PCJ-SLP14D-061196	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP14FB-061196
E13	6/11/96	SBLK01-49534	PCJ-SLP14D-061196	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP14FB-061196
E15	6/11/96	SBLK01-49534	PCJ-SLP14D-061196	PCJ-SLP10MS-061096	PCJ-SLP10MSD-061096	PCJ-SLP14FB-061196

### RAP Section 7.4.1 2nd HALF

E2	10/8/96	SBLK01-51936	PCJ-E2D-100896	STP-SLP3MS-100796	STP-SLP3MSD-100796	PCJ-E2FB-100896
E7	10/8/96	SBLK01-51936	PCJ-E2D-100896	STP-SLP3MS-100796	STP-SLP3MSD-100796	PCJ-E2FB-100896
E15	10/8/96	SBLK01-51936	PCJ-E2D-100896	STP-SLP3MS-100796	STP-SLP3MSD-100796	PCJ-E2FB-100896
E13	10/8/96	SBLK01-51936	PCJ-E2D-100896	STP-SLP3MS-100796	STP-SLP3MSD-100796	PCJ-E2FB-100896
W48		NOT AVAILABLE				
W401	10/15/96	SBLK01-52075	GAC-SLP4TD-101596	GAC-SLP4TMS-101596	GAC-SLP4TMSD-101596	GAC-SLP4TFB-101596

### ADDITIONAL MONITORING RAP SECTION 12.1.1

SLP6	8/27/96	SBLK01-51190	PCJ-SLP6D-082796	PCJ-SLP6MS-082796	PCJ-SLP6MSD-082796	PCJ-SLP6FB-082796
SLP6	10/28/96	SBLK01-52325	PCJ-SLP6D-102896	PCJ-SLP6MS-102896	PCJ-SLP6MSD-102896	PCJ-SLP6FB-102896
SLP6	11/18/96	SBLK01-52656	PCJ-SLP6D-111896	PCJ-SLP6MS-111896	PCJ-SLP6MSD-111896	PCJ-SLP6FB-111896
SLP6	12/16/96	SBLK01-53041	PCJ-SLP6D-121696	PCJ-SLP6MS-121696	PCJ-SLP6MSD-121696	PCJ-SLP6FB-121696

**CITY OF ST. LOUIS PARK**  
**Prairie duChien-Jordan Aquifer**  
**Analytical Result Summary**  
**1996**

Well	Elevations Coordinates	Date	Water Level	PAH Concentrations			<i>ug/L</i> Phenols
				B(a)P	D(a,h)A	Carcin	
SLP 4  7.3(A)	904.87  2171289						
		6/4/96	741.67				431 ND
	704002	9/30/96	791.45				526 0.005
		11/5/96	761.03				
SLP 5  7.3(E)	927.13  2159575						
		6/4/96	790.98				
	708593						
		11/5/96	810.58				
SLP 6  7.3(C)	914.87  2167623						
		6/4/96				1	180
	701776	8/27/96					178
		10/28/96					189
SLP 7  7.3(C)	903.49  2162946						
		6/4/96	791.53				22
	744571						
		11/5/96	810.29				
SLP 8  7.3(F)	940.07  2154753						
		6/4/96	762.68				
	718173						
		11/5/96	784.87				
SLP 9  7.3(C)	897.63  2162946						
		6/4/96	790.79				
	744571						
		11/5/96	809.20				
SLP 10  7.3(D)	927.81  2163874						
		6/10/96	747.71				1,742
	711710						
		11/5/96	762.03				
SLP 14  7.3(D)	906.54  2166856						
		6/11/96					52
	717119						
		11/5/96					

**CITY OF ST. LOUIS PARK**  
**Prairie duChien-Jordan Aquifer**  
**Analytical Result Summary**  
**1996**

Well	Elevations Coordinates	Date	Water Level	PAH Concentrations			<i>ng/L</i>	<i>ug/L</i>
				B(a)P	D(a,h)A	Carcin		
SLP 15	924.08							
	2164035	6/4/96	758.25					
	711954							
		11/5/96	773.93					
SLP 16	934.34							
	2156445	6/17/96	784.88	0	0	0	8	
	71557							
		11/5/96	807.55					
E 2	878.00							
	2170900	6/11/96					14	
	697630							
		10/8/96					20	
E 3	877.00							
	2173410	6/11/96	766.30				3	
	696040							
		11/5/96	796.50					
E 4	889.00							
	2169920	6/11/96	780.30					
	693270							
		11/5/96	791.50					
E 7	852.00							
	2166820	6/11/96	681.20				3	
	695250							
		10/8/96	699.80				5	
E 13	932.00							
	2156780	6/11/96	854.70				4	
	700680							
		10/8/96	773.00				6	
E 15	897.50							
	2163550	6/11/96	774.30				10	
	697810							
		10/8/96	800.90				29	

**CITY OF ST. LOUIS PARK**  
**Prairie duChien-Jordan Aquifer**  
**Analytical Result Summary**  
**1996**

Well	Elevations Coordinates	Date	Water Level	PAH Concentrations			<i>ug/L</i> Phenols
				B(a)P	D(a,h)A	Carcin	
MTK 6	916.47						
	2151704	6/17/96	789.97			4	
7.3(E)	711728						
		11/5/96	798.27				
W 23	897.33						
	2163150	4/15/96	790.72			48,000	
7.3(B)	708116	7/15/96				50,000	
		11/5/96	809.41				
W 29	896.2						
	2162820	6/10/96	792.57			82	
7.3(E)	705997						
		11/5/96	811.73				
W 32	916.06						
	2160285	6/13/96	792.18				
7.3(F)	711588						
		11/5/96	811.73				
W 40							
	2167447	6/10/96				498	
7.3(E)	706887						
W 48	893.93						
	2165265	6/17/96	793.12		3	259	
7.3(C)	704256						
		11/5/96	811.29				

**CITY OF ST. LOUIS PARK**  
**Prairie duChien-Jordan Aquifer**  
**Analytical Result Summary**  
**1996**

Well	Elevations Coordinates	Date	Water Level	PAH Concentrations			<i>ng/L</i>	<i>ug/L</i> Phenols
				B(a)P	D(a,h)A	Carcin		
W 70	907.7 2170818	6/10/96	794.28					
							342	
7.3(E)	710878	11/5/96	811.60					
W 401	922.99 2174827	6/11/96	790.57				19	
7.3(E)		10/15/96	809.70				29	
W 402	2174827 702165	6/4/96	788.48			13	383	
7.3(D)	702165	11/5/96	807.19					
W 403	868.21 2173328	6/4/96	799.23			3	182	
7.3(D)	704870	11/5/96	814.78					
W 406	920.28 2176127	6/4/96	920.28				21	
7.3(D)	709357	11/5/96	810.71					

WELL	SLP4	W402	W403	W406	SLP6	SLP7	SLP14	E2	E3	
DATE	6/4/96	6/4/96	6/4/96	6/4/96	6/4/96	6/4/96	6/11/96	6/11/96	6/11/96	
2,3-Benzofuran	0	0	0		0	0				
2,3-Dihydroindene	160	26	52		53	2.8	16	4.6		
1H-Indene	8.2	28	19		3.2		1.4			
Naphthalene		36	16		7.3	6.7				
Benzo (b) Thiophene	50	230	20		7		1.5			
1H-Indole		0	10							
2-Methylnaphthalene	1.7	13	6.9	2	1.4	1.7	2.4	3.5	1.8	
1-Methylnaphthalene		13	16					1.6		
Biphenyl		0	0							
Acenaphthylene					20	1.8	9.3			
Acenaphthene	170	7.3	12	1.3	53	4.5	17	1.6		
Dibenzofuran		4.3	6.3		5.4					
Fluorene		5.6			17					
Dibenzothiophene										
Phenanthrene	5.4	6.6	7.6	2.4	7.2	3.1	2.3	2.6	1.6	
Anthracene	2.5				1					
Acridine	0				3.1					
Carbazole	27									
Fluoranthene	8.9	3	3		1.4					
Pyrene	7.1	10	13	15		1.8	1.6			
12-Dimethylbenz(a)anthracene										
Benzo (e) Pyrene										
Perylene										
3-Methylcholanthrene										
DibenZ (A,C) Anthracene										
Quinoline	C	13	3.4		1.4					
Benzo (a) Anthracene	C									
Chrysene	C									
Benzo (b) Fluoranthene	C									
Benzo (k) Fluoranthene	C									
Benzo (a) Pyrene	C					0	0	0		
Indino (1,2,3-cd) Pyrene	C									
DibenZ (a,h) Anthracene	C					0	0	0		
Benzo (g,h,i) Perylene	C									
TOTAL OTHER PAH		440.8	382.8	181.8	20.7	180	22.4	51.5	13.9	3.4
BENO(a)PYRENE + DIBENZO(A,H)	C	0	0	0	0	0	0	0	0	0
TOTAL CARCINOGEN	C	0	13	3.4	0	1.4	0	0	0	0
TOTAL PAH		440.8	395.8	185.2	20.7	181.4	22.4	51.5	13.9	3.4
Dilution Factor		2	2	1	1	1	1	1	1	1
Surrogate Recoveries										
Naphthalene-d8		72	78	78	76	72	69	79	74	73
Fluorene-d10		77	78	51	49	42	41	78	73	63
Chrysene-d12		64	68	64	71	72	66	55	50	55

WELL	E7	E13	E15	W401	W29	SLP10D	W40	W70
DATE	6/11/96	6/11/96	6/11/96	6/11/96	6/10/96	6/10/96	6/10/96	6/10/96
2,3-Benzofuran								
2,3-Dihydroindene				6.2	25	380	28	
1H-Indene						13	11	4.1
Naphthalene								
Benzo (b) Thiophene						40	9	
1H-Indole								
2-Methylnaphthalene	1.7	2	4	2	1.9			11
1-Methylnaphthalene			2			8		
Biphenyl						26		
Acenaphthylene					1.9	170	9.8	14
Acenaphthene				6.3	23	690	370	260
Dibenzofuran						26		
Fluorene			0.98	2.3	7	250		
Dibenzothiophene					1.5	30	5.1	
Phenanthrene	1.4	1.5	3.2	1.8	2.2			
Anthracene						5.6	5.9	
Acridine							17	
Carbazole								
Fluoranthene					10	40		
Pyrene					9.8	64	42	53
12-Dimethylbenz(a)anthracene								
Benzo (e) Pyrene								
Perylene								
3-Methylcholanthrene								
Dibenz (A,C) Anthracene								
Quinoline								
Benzo (a) Anthracene								
Chrysene								
Benzo (b) Fluoranthene								
Benzo (k) Fluoranthene								
Benzo (a) Pyrene	0	0	0	0	0	0	0	0
Indino (1,2,3-cd) Pyrene								
Dibenz (a,h) Anthracene	0	0	0	0	0	0	0	0
Benzo (g,h,i) Perylene								
<b>TOTAL OTHER PAH</b>	3.1	3.5	10.18	18.6	82.3	1742.6	497.8	342.1
<b>BENO(a)PYRENE + DIBENZO(A,H)</b>	0	0	0	0	0	0	0	0
<b>TOTAL CARCINOGEN</b>	0	0	0	0	0	0	0	0
<b>TOTAL PAH</b>	3.1	3.5	10.18	18.6	82.3	1742.6	497.8	342.1
Dilution Factor	1	1	1	1	1	5	4	4
Surrogate Recoveries								
Naphthalene-d8	74	73	68	68	66	0	73	0
Fluorene-d10	72	70	61	70	68	0	77	0
Chrysene-d12	48	57	39	51	44	0	159	0

WELL	SLP16	H6	MTK6	W48DIL	SLP6D	W401	SLP6
DATE	6/17/96	6/17/96	6/17/96	6/17/96	8/27/96	10/15/96	10/28/96
2,3-Benzofuran							
2,3-Dihydroindene	1.9			55	58	8.1	55
1H-Indene				18	7.2		3.5
Naphthalene							
Benzo (b) Thiophene				10	9.7		9.2
1H-Indole							
2-Methylnaphthalene	2	1.9	1.8		1.7	1.5	
1-Methylnaphthalene							
Biphenyl							
Acenaphthylene					15	1.6	21
Acenaphthene	2.2			120	48	10	54
Dibenzofuran					4.2		8
Fluorene				5.5	15	4.1	24
Dibenzothiophene					1.1		
Phenanthrene	1.7	1.4	1.7		6.1	3.8	12
Anthracene				5.6			1.4
Acridine				35	5.6		
Carbazole					2.4		
Fluoranthene					2.6		1.5
Pyrene				9.6	1.7		
12-Dimethylbenz(a)anthracene							
Benzo (e) Pyrene							
Perylene							
3-Methylcholanthrene							
Dibenz (A,C) Anthracene							
Quinoline							
Benzo (a) Anthracene							
Chrysene							
Benzo (b) Fluoranthene							
Benzo (k) Fluoranthene							
Benzo (a) Pyrene					0	0	0
Indino (1,2,3-cd) Pyrene							
Dibenz (a,h) Anthracene					0	0	0
Benzo (g,h,i) Perylene							
<b>TOTAL OTHER PAH</b>	7.8	3.3	3.5	258.7	178.3	29.1	189.6
<b>BENO(a)PYRENE + DIBENZO(A,H)</b>	0	0	0	0	0	0	0
<b>TOTAL CARCINOGEN</b>	0	0	0	0	0	0	0
<b>TOTAL PAH</b>	7.8	3.3	3.5	258.7	178.3	29.1	189.6
Dilution Factor	1	1	1	58	1	1	1
Surrogate Recoveries							
Naphthalene-d8	80	69	73	OD	68	74	102
Fluorene-d10	62	46	44	OD	77	61	95
Chrysene-d12	77	68	67	OD	32	19	46

WELL	SLP6	SLP4D	PCJ-E7	E-15	E-13	E2
DATE	11/18/96	9/30/96	10/8/96	10/8/96	10/8/96	10/8/96
2,3-Benzofuran						
2,3-Dihydroindene	74	200				4
1H-Indene	8.6	11				
Naphthalene						
Benzo (b) Thiophene	12	58				
1H-Indole						
2-Methylnaphthalene	2.9		1.7	15	1.8	2.2
1-Methylnaphthalene	1.8			8.1		
Biphenyl						
Acenaphthylene	20					
Acenaphthene	63	190				1.9
Dibenzofuran	7.1			1.1		1.2
Fluorene	21					1
Dibenzothiophene	1.8	2.2				
Phenanthrene	11	5.7	2.9	4.5	3.6	5.1
Anthracene	1.8	3				
Acridine	3.6					
Carbazole	2.8	33				
Fluoranthene	3.3	13				1.8
Pyrene	3.3	10				2.3
12-Dimethylbenz(a)anthracene	3.3					
Benzo (e) Pyrene						
Perylene						
3-Methylcholanthrene						
Dibenz (A,C) Anthracene						
Quinoline	1.5					
Benzo (a) Anthracene						
Chrysene						
Benzo (b) Fluoranthene						
Benzo (k) Fluoranthene						
Benzo (a) Pyrene	0	0	0	0	0	0
Indino (1,2,3-cd) Pyrene						
Dibenz (a,h) Anthracene	0	0	0	0	0	0
Benzo (g,h,i) Perylene						
<b>TOTAL OTHER PAH</b>	<b>241.3</b>	<b>525.9</b>	<b>4.6</b>	<b>28.7</b>	<b>5.4</b>	<b>19.5</b>
<b>BENO(a)PYRENE + DIBENZO(A,H)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL CARCINOGEN</b>	<b>1.5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL PAH</b>	<b>242.8</b>	<b>525.9</b>	<b>4.6</b>	<b>28.7</b>	<b>5.4</b>	<b>19.5</b>
Dilution Factor	1	2	1	1	1	1
Surrogate Recoveries						
Naphthalene-d8	103	104	91	78	84	86
Fluorene-d10	112	72	81	69	68	73
Chrysene-d12	37	48	34	26	30	34

## RAP SECTION 7.3 (A) MONITORING

**WELLS**  
SLP4

## **FIRST HALF MONITORING**

## **PAH MONITORING**

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303 421-6611 Telephone  
303 431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

July 19, 1996

Quanterra Environmental Services

Project Number 049403

### Introduction

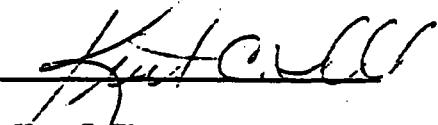
Ten aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on June 5, 1996. The samples were logged in under Quanterra Denver's project number 049403. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

### Data Quality Assessment

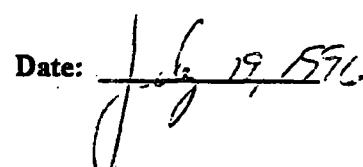
The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By:



Date:

  
7/19/96

Kurt C. Ill  
Program Manager

Reviewed By:



Date:

  
7/19/96

**QUALIFIER CODES AND THEIR USAGE**

- A = This flag indicates that a TIC is a suspected aldol-condensation product.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.
- C = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, the the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately; e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L:
- J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

**QUALIFIER CODES AND THEIR USAGE**  
Page Two

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

S = The concentration of this compound saturated the capacity of the detector and a valid quantitation could not be obtained at this dilution.

U = Indicates compound was analyzed for, but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.

X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".

R = Target compound's secondary ion confirmation not met, however peak shape and retention time make peak identification positive.

**ANALYTICAL TEST REQUESTS  
for  
City of St. Louis Park**

Lab ID: <b>049403</b>	Group Code	Analysis Description	Custom Test?
0001 - 0008	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N
0002	B	Prep - PAH/SIM by GC/MS Low Level Polynuclear Aromatic Hydrocarbons, SIM Low Level	N

**SAMPLE DESCRIPTION INFORMATION**  
 for  
**City of St. Louis Park**

Lab ID	Client ID	Matrix	Sampled Date	Received Time	Received Date
049403-0001-SA	PCJ-SLP4-060496	AQUEOUS	04 JUN 96		05 JUN 96
049403-0001-DU	PCJ-SLP4D-060496	AQUEOUS	04 JUN 96		05 JUN 96
049403-0002-FB	PCJ-SLP4FB-060496	AQUEOUS	04 JUN 96		05 JUN 96
049403-0002-FD	PCJ-SLP4FBD-060496	AQUEOUS	04 JUN 96		05 JUN 96
049403-0003-SA	PCJ-W402-060496	AQUEOUS	04 JUN 96	12:30	05 JUN 96
049403-0004-SA	PCJ-W403-060496	AQUEOUS	04 JUN 96	14:30	05 JUN 96
049403-0005-SA	PCJ-W406-060496	AQUEOUS	04 JUN 96	10:20	05 JUN 96
049403-0006-SA	STP-P116-060496	AQUEOUS	04 JUN 96	16:30	05 JUN 96
049403-0007-SA	PCJ-SLP6-060496	AQUEOUS	04 JUN 96		05 JUN 96
049403-0008-SA	PCJ-SLP7-060496	AQUEOUS	04 JUN 96		05 JUN 96

Anvada, Colorado 80002

**303 421-6611 Telephone  
303 431-7171 Fax**

Digitized by srujanika@gmail.com

QUANTERRA CLIENT

PROJECT

SAMPLING COMPANY

SA ME

TEAM LEADER

City of St. Louis Park  
3752 Wooddale Ave So  
St. Louis Park MN 55416

DATE

TIME

SAMPLE ID/DESCRIPTION

SAMPLE TYPE

# CONTAINERS

ANALYSIS PARAMETERS

REMARKS

6-4-96

PCU-SLP 4FB - 06042G

1XL AMBER

6

PPT PAH

PPT 5

-2 FB

6-4-96

PCU-SLP 4FBD - 06042G

1XL AMBER

6

PPT PAH

PPT 5

-2 FD

CUSTODY TRANSFERS PRIOR TO SHIPPING

RELINQUISHED BY (SIGNED)

RECEIVED BY (SIGNED)

DATE

TIME

DELIVERED TO SHIPPER BY

212X

METHOD OF SHIPMENT

FED EX

RECEIVED FOR LAB

QES

QUANTERRA PROJECT NUMBER

AIRBILL NUMBER

7828345663

DATE/TIME  
6/4/96 9:30

49903

SAMPLE SAFE™ CONDITIONS

PACKED BY

212X

SEAL NUMBER

SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY

CONDITION OF CONTENTS

SEALED FOR SHIPPING BY

212X

INITIAL CONTENTS TEMP.

°C

SEAL NUMBER

SAMPLING STATUS

Done

Continuing Until

SEAL INTACT UPON RECEIPT BY LAB.

Yes

No

CONTENTS TEMPERATURE UPON RECEIPT BY LAB.

7.5 °C



# Chain of Custody Record

QUA-4124-1

Environmental  
Services

Client

City of St Louis Park  
5005 Minka Blvd

Project Manager

B71 Group

Telephone Number (Area Code) / Fax Number

612-924-0117

Date

6/4/96

Chain Of Custody Number

66151

Address

St Louis Park MN 55416

City

State

Zip Code

Site Contact

Sco A. Anthony

Lab Contact

Project Name

SCP

Contract/Purchase Order/Quote No.

Lab Number

Page

1 of 1

Analysis (Attach list if  
more space is needed)Special Instructions/  
Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix		Containers & Preservatives										
			WATER	Sed.	Sed.	LIQUID	SOIL	H2O2	HCl	ASR	ZINC	PAN	PCP		
PCJ-W406-060496	6/4/96	10:20	X			6					X				PFT-5
STP-D116-060496	6/4/96	16:30	X			6					X				PFT-5

## Possible Hazard Identification

 Non-Hazard  Flammable  Skin Irritant  Poison B Unknown

## Sample Disposal

 Return To Client Disposal By Lab  
QC Requirements (Specify) Archive For Months longer than 3 months

## Turn Around Time Required

 24 Hours  48 Hours  Days  14 Days  21 Days  Other

Standard

## 1. Relinquished By

DIA/Mor

Date Time

6/4/96

## 2. Relinquished By

Date Time

6/4/96

## 3. Relinquished By

Date Time

6/4/96

1. Received By

Standard Rep Conferec

2. Received By

TDe C/ce

Date Time

6/5/96 9:30

Date Time

## Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Arvada, Colorado 80002

**303 421-6611 Telephone  
303 431-7171 Fax**

Services

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP4

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

Matrix: (soil/water) WATER

Lab Sample ID: 49403-01

Sample wt/vol: 4145 (g/ml) ML

Lab File ID: A0901250

Level: (low/med) LOW

Date Received: 06/05/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/07/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/12/96

Injection Volume: 1.0 (uL)

Dilution Factor: 2.0

HPLC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND		Q
271-89-6-----	2,3-Benzofuran	9.8	U
496-11-7-----	2,3-Dihydroindene	160	_____
95-13-6-----	1H-Indene	8.2	_____
91-20-3-----	Naphthalene	12	U
95-15-8-----	Benzo(b)thiophene	50	_____
91-22-5-----	Quinoline	2.7	U
120-72-9-----	1H-Indole	4.8	U
91-57-6-----	2-Methylnaphthalene	1.7	U
90-12-0-----	1-Methylnaphthalene	3.1	U
92-52-4-----	Biphenyl	8.3	U
208-96-8-----	Acenaphthylene	2.7	U
83-32-9-----	Acenaphthene	160	_____
132-64-9-----	Dibenzofuran	1.9	U
86-73-7-----	Fluorene	1.9	U
132-65-0-----	Dibenzothiophene	2.1	U
85-01-8-----	Phenanthrene	5.5	_____
120-12-7-----	Anthracene	2.4	_____
260-94-6-----	Acridine	5.6	U
86-74-8-----	Carbazole	28	_____
206-44-0-----	Fluoranthene	9.2	_____
129-00-0-----	Pyrene	7.2	_____
56-55-3-----	Benzo(a)Anthracene	4.8	U
218-01-9-----	Chrysene	5.4	U
207-08-9-----	Benzo(b)fluoranthene	4.8	U
205-08-9-----	Benzo(k)fluoranthene	4.4	U
192-97-2-----	Benzo(e)pyrene	3.7	U
50-32-8-----	Benzo(a)pyrene	4.4	U
198-55-0-----	Perylene	4.8	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	4.0	U
53-70-3-----	Dibenzo(a,h)anthracene	3.1	U
191-24-2-----	Benzo(g,h,i)perylene	5.4	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP4D

ab Name: QUANTERRA DENVER

Contract:

ab Code: Case No.: 49403 SAS No.: SDG No.: 49403

atrix: (soil/water) WATER Lab Sample ID: 49403-01DU

ample wt/vol: 4145 (g/ml) ML Lab File ID: A1001251

evel: (low/med) LOW Date Received: 06/05/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/07/96

concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/12/96

jection Volume: 1.0 (uL) Dilution Factor: 2.0

HPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	Q
271-89-6-----	2,3-Benzofuran	9.8	U
496-11-7-----	2,3-Dihydroindene	160	_____
95-13-6-----	1H-Indene	8.2	_____
91-20-3-----	Naphthalene	12	U
95-15-8-----	Benzo(b)thiophene	50	_____
91-22-5-----	Quinoline	2.7	U
120-72-9-----	1H-Indole	4.8	U
91-57-6-----	2-Methylnaphthalene	1.7	_____
90-12-0-----	1-Methylnaphthalene	3.1	U
92-52-4-----	Biphenyl	8.3	U
208-96-8-----	Acenaphthylene	2.7	U
83-32-9-----	Acenaphthene	170	_____
132-64-9-----	Dibenzofuran	1.9	U
86-73-7-----	Fluorene	1.9	U
132-65-0-----	Dibenzothiophene	2.1	U
85-01-8-----	Phenanthrene	5.4	_____
120-12-7-----	Anthracene	2.5	_____
260-94-6-----	Acridine	5.6	U
86-74-8-----	Carbazole	27	_____
206-44-0-----	Fluoranthene	8.9	_____
129-00-0-----	Pyrene	7.1	_____
56-55-3-----	Benzo(a)Anthracene	4.8	U
218-01-9-----	Chrysene	5.4	U
207-08-9-----	Benzo(b)fluoranthene	4.8	U
205-08-9-----	Benzo(k)fluoranthene	4.4	U
192-97-2-----	Benzo(e)pyrene	3.7	U
50-32-8-----	Benzo(a)pyrene	4.4	U
198-55-0-----	Perylene	4.8	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	4.0	U
53-70-3-----	Dibenzo(a,h)anthracene	3.1	U
191-24-2-----	Benzo(g,h,i)perylene	5.4	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP4FB

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

six: (soil/water) WATER

Lab Sample ID: 49403-02FB

ple wt/vol: 4171 (g/ml) ML

Lab File ID: A0901277

el: (low/med) LOW

Date Received: 06/05/96

oisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/07/96

centrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/11/96

ection Volume: 1.0 (uL)

Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	3.0	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.4	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	4.2	U
90-12-0-----	1-Methylnaphthalene	1.8	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	0.96	U
86-73-7-----	Fluorene	0.96	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.2	U
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP4FBD

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

Mix: (soil/water) WATER

Lab Sample ID: 49403-02FD

Sample wt/vol: 4110 (g/ml) ML

Lab File ID: A1001278

Media: (low/med) LOW

Date Received: 06/05/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/07/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/11/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	U
271-89-6-----	2,3-Benzofuran	5.0	U
496-11-7-----	2,3-Dihydroindene	3.0	_____
95-13-6-----	1H-Indene	0.88	U
91-20-3-----	Naphthalene	6.3	U
95-15-8-----	Benzo(b)thiophene	0.88	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	4.1	_____
90-12-0-----	1-Methylnaphthalene	1.9	_____
92-52-4-----	Biphenyl	4.2	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	0.97	U
86-73-7-----	Fluorene	0.97	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	1.3	_____
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

<sup>2C</sup>  
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	SBLK01	71	90	74						0
02	DCS1	66	110	68						0
03	DCS2	62	114	58						0
04	SLP4FB	62	85	69						0
05	SLP4FBD	63	81	67						0
06	P116	55	37	65						0
07	SLP4	72	77	64						0
08	SLP4D	72	88	66						0
09	W406	76	49	71						0
10	W403	78	51	64						0
11	SLP6	72	42	72						0
12	SLP7	69	41	66						0
13	W402	78	78	68						0
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

**1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET**

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

DCS1

Lab Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

Matrix: (soil/water) WATER

Lab Sample ID: 49403-DCS1

Sample wt/vol: 4000 (g/ml) ML

Lab File ID: A0501273

Level: (low/med) LOW

Date Received: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/07/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/10/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
95-13-6-----	1H-Indene	4.9	_____
91-20-3-----	Naphthalene	7.1	_____
91-22-5-----	Quinoline	5.3	_____
91-57-6-----	2-Methylnaphthalene	7.2	_____
86-73-7-----	Fluorene	7.4	_____
218-01-9-----	Chrysene	4.8	_____
192-97-2-----	Benzo(e)pyrene	6.2	_____

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DCS2

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

Matrix: (soil/water) WATER

Lab Sample ID: 49403-DCS2

Sample wt/vol: 4000 (g/ml) ML

Lab File ID: A0601274

Level: (low/med) LOW

Date Received: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/07/96

Concentrated Extract Volume: 0.5 (mL)

Date Analyzed: 07/10/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
95-13-6-----	1H-Indene	3.9	
91-20-3-----	Naphthalene	5.7	
91-22-5-----	Quinoline	5.3	
91-57-6-----	2-Methylnaphthalene	5.8	
86-73-7-----	Fluorene	5.8	
218-01-9-----	Chrysene	4.4	
192-97-2-----	Benzo(e)pyrene	5.5	

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Name: QUANTERRA DENVER

Contract:

Case: Case No.: 49403

SAS No.:

SDG No.: 49403

File ID: A0401272

Lab Sample ID: SBLK01

Instrument ID: A

Date Extracted: 06/07/96

Matrix: (soil/water) WATER

Date Analyzed: 07/10/96

Rel: (low/med) LOW

Time Analyzed: 2106

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 DCS1	49403-DCS1	A0501273	07/10/96
02 DCS2	49403-DCS2	A0601274	07/10/96
03 SLP4FB	49403-02FB	A0901277	07/11/96
04 SLP4FBD	49403-02FD	A1001278	07/11/96
05 P116	49403-06	A1201280	07/11/96
06 SLP4	49403-01	A0901250	07/12/96
07 SLP4D	49403-01DU	A1001251	07/12/96
08 W406	49403-05	A0201287	07/16/96
09 W403	49403-04	A03C1288	07/16/96
10 SLP6	49403-07	A0501290	07/16/96
11 SLP7	49403-08	A0601291	07/16/96
12 W402	49403-03	A0701292	07/16/96
13			
14			
15			
16			
17			
18			
19			
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21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

MENTS:

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1 of 1

FORM IV SV

3/90

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK01

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

Matrix: (soil/water) WATER

Lab Sample ID: SBLK01

Sample wt/vol: 4000 (g/ml) ML

Lab File ID: A0401272

Level: (low/med) LOW

Date Received: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/07/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/10/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	Q
271-89-6-----	2,3-Benzofuran	5.1	U
496-11-7-----	2,3-Dihydroindene	1.4	U
95-13-6-----	1H-Indene	0.90	U
91-20-3-----	Naphthalene	6.5	U
95-15-8-----	Benzo(b)thiophene	0.90	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.5	U
91-57-6-----	2-Methylnaphthalene	0.90	U
90-12-0-----	1-Methylnaphthalene	1.6	U
92-52-4-----	Biphenyl	4.3	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	1.0	U
86-73-7-----	Fluorene	1.0	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	1.3	U
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.9	U
86-74-8-----	Carbazole	1.9	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.5	U
218-01-9-----	Chrysene	2.8	U
207-08-9-----	Benzo(b)fluoranthene	2.5	U
205-08-9-----	Benzo(k)fluoranthene	2.3	U
192-97-2-----	Benzo(e)pyrene	1.9	U
50-32-8-----	Benzo(a)pyrene	2.3	U
198-55-0-----	Perylene	2.5	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.8	U

88  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name : QUANTERRA DENVER

**Contract:**

**Code:** Case No.: 49403

SAS No.:

SDG No.: 49403

**File ID (Standard): A0268**

Date Analyzed: 07/10/96

Instrument ID: A

Time Analyzed: 1814

**IS1 (ANT) = Acenaphthene-d10**

**IS2 (PHN)** = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

**AREA LOWER LIMIT** = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

2 1 of 1

**FORM VIII SV-1**

3 / 90

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

File ID (Standard): A0242

Date Analyzed: 07/11/96

Instrument ID: A

Time Analyzed: 1929

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	111184	12.15	177563	14.56	114265	21.17
UPPER LIMIT	222368	12.65	355126	15.06	228530	21.67
LOWER LIMIT	55592	11.65	88782	14.06	57132	20.67
EPA SAMPLE NO.						
1 SLP4	141647	12.15	251370	14.55	219964	21.17
2 SLP4D	139462	12.15	268240	14.55	209434	21.17
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

8B  
SEMOVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

☐ Name: QUANTERRA DENVER                      Contract:  
 ☐ Code:    Case No.: 49403                      SAS No.:                              SDG No.: 49403  
 ☐ File ID (Standard): A285                      Date Analyzed: 07/16/96  
 ☐ Instrument ID: A                              Time Analyzed: 0832

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	87359	12.07	144408	14.47	76774	21.08
UPPER LIMIT	174718	12.57	288816	14.97	153548	21.58
LOWER LIMIT	43680	11.57	72204	13.97	38387	20.58
EPA SAMPLE NO.						
1 W406	101415	12.06	159984	14.46	108918	21.07
2 W403	112310	12.06	224850	14.45	149077	21.07
3 SLP6	99868	12.06	175566	14.45	133890	21.07
4 SLP7	106585	12.06	179368	14.45	149897	21.08
5 W402	94112	12.06	187313	14.45	135535	21.07
6						
7						
8						
9						
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						
1						
2						

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

**2C**  
**WATER SEMIVOLATILE SURROGATE RECOVERY**

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT #
01	SBLK01	71	90	74						0
02	DCS1	66	110	68						0
03	DCS2	62	114	58						0
04	SLP4FB	62	85	69						0
05	SLP4FBD	63	81	67						0
06	P116	55	37	65						0
07	SLP4	72	77	64						0
08	SLP4D	72	88	66						0
09	W406	76	49	71						0
10	W403	78	51	64						0
11	SLP6	72	42	72						0
12	SLP7	69	41	66						0
13	W402	78	78	68						0
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

Name: QUANTERRA DENVER

Contract:

SBLK01

Code: Case No.: 49403 SAS No.:

SDG No.: 49403

File ID: A0401272

Lab Sample ID: SBLK01

Instrument ID: A

Date Extracted: 06/07/96

Matrix: (soil/water) WATER

Date Analyzed: 07/10/96

Level: (low/med) LOW

Time Analyzed: 2106

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 DCS1	49403-DCS1	A0501273	07/10/96
02 DCS2	49403-DCS2	A0601274	07/10/96
03 SLP4FB	49403-02FB	A0901277	07/11/96
04 SLP4FBD	49403-02FD	A1001278	07/11/96
05 P116	49403-06	A1201280	07/11/96
06 SLP4	49403-01	A0901250	07/12/96
07 SLP4D	49403-01DU	A1001251	07/12/96
08 W406	49403-05	A0201287	07/16/96
09 W403	49403-04	A0301288	07/16/96
10 SLP6	49403-07	A0501290	07/16/96
11 SLP7	49403-08	A0601291	07/16/96
12 W402	49403-03	A0701292	07/16/96
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

MENTS:

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

**Contract:**

**Code:** Case No.: 49403

SAS No.:

SDG No.: 49403

File ID (Standard) : A0268

Date Analyzed: 07/10/96

Instrument ID: A

Time Analyzed: 1814

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

TS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

\* Values outside of QC limits.

3 of 1

**FORM VIII SV-1**

3 / 90

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 49403 SAS No.: SDG No.: 49403

File ID (Standard): A0242

Date Analyzed: 07/11/96

Instrument ID: A

Time Analyzed: 1929

	IS1 (ANT) AREA #	RT #	IS2 (PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	111184	12.15	177563	14.56	114265	21.17
UPPER LIMIT	222368	12.65	355126	15.06	228530	21.67
LOWER LIMIT	55592	11.65	88782	14.06	57132	20.67
EPA SAMPLE NO.						
1 SLP4	141647	12.15	261370	14.55	219964	21.17
2 SLP4D	139462	12.15	268240	14.55	209434	21.17
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

**8B**  
**SEMI-VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY**

Name : QUANTERRA DENVER

### **Contract:**

**Code:** Case No.: 49403

**SAS No. :**

SDG No.: 49403

File ID (Standard) : A285

Date Analyzed: 07/16/96

Instrument ID: A

Time Analyzed: 0832

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo (a) pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

```
# Column used to flag internal standard area values with an asterisk.
```

\* Values outside of QC limits.

1 of 1

**FORM VIII SV-1**

3 / 90

## **PHENOLICS MONITORING**

U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA

Contract: CITY SLP

4833508

Lab Code: DENVER Case No.: SAS No.: SDG No.: 48335

10

SAS No.: \_\_\_\_\_

SDG No.: 48335

Matrix (soil/water): WATER

Lab Sample ID: 4833508

Level (low/med): LOW

Date Received: 04/16/9

% Solids: 0.0

Concentration

Concentration Units (ug/L or mg/kg dry weight): UG/L

**Color Before:** COLORLESS

## Clarity Before: CLEAR

**Texture:**

**Color After:** COLORLESS

**Clarity After:** CLEAR

## Artifacts:

**Comments:**

PCJ-SLP4TP-041596

**FORM I - IN**

7/88

## **SECOND HALF MONITORING**

## **PAH MONITORING**

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303-421-6611 Telephone  
303-431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

November 15, 1996

Quanterra Environmental Services

Project Number 051769

### Introduction

Eleven aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on October 1, 1996. The samples were logged in under Quanterra Denver's project number 051769. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

### Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

Client sample with lab IDs 051769-001, 003, 006 and 007 had to be diluted due to target analytes exceeding the linear range of the instrument. The reporting limits were raised accordingly. As a result of dilution the surrogates for samples 051769-003, 006 and 007 were not detected and are reported as "D."

The surrogate benzo (e) pyrene was not recovered in the matrix spike and matrix spike duplicate samples. All surrogates were recovered within acceptable limits in both the Laboratory Control Sample and the blank. Matrix effect is indicated.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By: Kurt C. Ill Date: 11/15/96  
Kurt C. Ill  
Program Manager

Reviewed By: Mia DeRicci Date: 11/15/96

**SAMPLE DESCRIPTION INFORMATION  
for  
City of St. Louis Park**

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
051769-0001-SA	PCJ-SLP4-093096	AQUEOUS	30 SEP 96		01 OCT 96
051769-0001-DU	PCJ-SLP4D-093096	AQUEOUS	30 SEP 96		01 OCT 96
051769-0001-MS	PCJ-SLP4MS-093096	AQUEOUS	30 SEP 96		01 OCT 96
051769-0001-SD	PCJ-SLP4MSD-093096	AQUEOUS	30 SEP 96		01 OCT 96
051769-0002-FB	PCJ-SLP4FB-093096	AQUEOUS	30 SEP 96		01 OCT 96
051769-0002-FD	PCJ-SLP4FBD-093096	AQUEOUS	30 SEP 96		01 OCT 96
051769-0003-SA	DPV-W124-093096	AQUEOUS	30 SEP 96	16:55	01 OCT 96
051769-0004-SA	DPV-W121-093096	AQUEOUS	30 SEP 96	16:00	01 OCT 96
051769-0005-SA	DPV-W1-093096	AQUEOUS	30 SEP 96	10:50	01 OCT 96
051769-0006-SA	DPV-W20-093096	AQUEOUS	30 SEP 96	13:00	01 OCT 96
051769-0007-SA	DPV-W22-093096	AQUEOUS	30 SEP 96	14:40	01 OCT 96

**ANALYTICAL TEST REQUESTS**  
**for**  
**City of St. Louis Park**

**Page 1 of 1**

<b>Lab ID:</b> <b>051769</b>	<b>Group Code</b>	<b>Analysis Description</b>	<b>Custom Test?</b>
0001 - 0007	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N N
0002	B	Prep - PAH/SIM by GC/MS Low Level Polynuclear Aromatic Hydrocarbons, SIM Low Level	N N



**Chain of Custody  
Record**

**Quanterra**  
Environmental  
Services

QUA-4124-1

Client

City of St. Louis Park  
3752 WOODDALE AVE SO  
ST LOUIS PARK MN 55416

Project Manager

SCOTT ANDERSON

Date  
9-30-96

Chain Of Custody Number  
65900

Address

Lab Number

City

Page \_\_\_\_\_ of \_\_\_\_\_

Project Name

SAMPLE

Contract/Purchase Order/Quote No.

Site Contact

Lab Contact  
924-2557 (612) 924-2520

Analysis (Attach list if  
more space is needed)

Sample I.D. No. and Description  
(Containers for each sample may be combined on one line)

Carrier/Waybill Number

FED EX

Matrix

Containers &  
Preservatives

AGJ-T-SLP4FBD-093096

Date  
9-30-96

Time  
X

PCJ-T-SLP4FBD-093096

9-30-96

PCJ-T-SLP4MS-093096

9-30-96

PPT PPT

X

PPT 5 -01 FBD

X

PPT 5 -02 FBD

X

PPT 5 -01 MS

Possible Hazard Identification

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Sample Disposal

Return To Client

Disposal By Lab

Archive For \_\_\_\_\_ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required

QA Requirements (Specify)

24 Hours  48 Hours  7 Days  14 Days  21 Days  Other

1. Relinquished By

Date  
9-30-96

Time  
2:30

1. Received By

J. Rech

Date  
10/11/96

Time  
915

2. Relinquished By

Date

Time

2. Received By

3. Relinquished By

Date

Time

3. Received By

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy





### Organic EPA-defined Data Qualifiers

- U-** Indicates compound was analyzed for, but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture. For example, if the sample had 24% moisture and a 1 to 10 dilution factor, the sample quantitation limit for phenol (330 U) would be corrected to:

$$\frac{(330 \text{ U}) \times \text{Df}}{\text{D}} \quad \text{Where } D = \frac{100 - \% \text{ moisture}}{100}$$

and Df = Dilution factor

$$\text{For example, at 24\% moisture, } D = \frac{100 - 24}{100} = 0.76$$

$$\frac{(330 \text{ U}) \times 10}{0.76} = 4300 \text{ U} \quad \text{rounded to the appropriate number of significant figures}$$

For semivolatile soil samples, the extract must be concentrated to 0.5 mL, and the sensitivity of the analysis is not compromised by the cleanup procedures. Similarly, pesticide samples subjected to GPC are concentrated to 5.0 mL. Therefore, the CRQL values in Exhibit C will apply to all samples, regardless of the cleanup. However, if a sample extract cannot be concentrated to the protocol-specified volume (see Exhibit C), this fact must be accounted for in reporting the sample quantitation limit.

- J-** Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, 2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL but greater than zero, 3) when the retention time data indicate the presence of a compound that meets the pesticide/Aroclor identification criteria and the result is less than the CRQL but greater than zero. Note: the "J" code is not used and the compound is not reported as being identified for pesticide/Aroclor results less than the CRQL, if the technical judgement of the pesticide residue analysis expert determines that the peaks used for compound identification resulted from instrument noise or other interferences. (column bleed, solvent contamination, etc.). For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.

- N-** Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

- P-** This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentration between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

- C- This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- B- This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.
- E- This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed according to the specification in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of the peak representing the single isomer exceeds 200 ug/L or the peak representing the two coeluting isomers on that GC column exceeds 400 ug/L. Similarly, if the two 1,2-Dichloroethene isomers coelute, a diluted analysis is not required unless the concentration exceeds 400 ug/L.
- D- This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- A- This flag indicates that a TIC is a suspected aldol-condensation product.
- X- Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some samples. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".

The combination of flags "BU" or "UB" is expressly prohibited. Blank contaminants are flagged "B" only when they are detected in the sample.

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP4

b Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 51769

SAS No.:

SDG No.: 51769

Matrix: (soil/water) WATER

Lab Sample ID: 51769-01

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: A1401040

Level: (low/med) LOW

Date Received: 10/01/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 10/02/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 10/08/96

Injection Volume: 1.0 (uL)

Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
---------	----------	---	------	---

271-89-6-----	2, 3-Benzofuran	9.7	U
496-11-7-----	2, 3-Dihydroindene	170	_____
95-13-6-----	1H-Indene	9.1	_____
91-20-3-----	Naphthalene	12	U
95-15-8-----	Benzo(b)thiophene	52	_____
91-22-5-----	Quinoline	2.7	U
120-72-9-----	1H-Indole	4.8	U
91-57-6-----	2-Methylnaphthalene	1.7	U
90-12-0-----	1-Methylnaphthalene	3.0	U
92-52-4-----	Biphenyl	8.2	U
208-96-8-----	Acenaphthylene	2.7	U
83-32-9-----	Acenaphthene	190	_____
132-64-9-----	Dibenzofuran	1.9	U
86-73-7-----	Fluorene	1.9	U
132-65-0-----	Dibenzothiophene	2.7	_____
85-01-8-----	Phenanthrene	5.7	B
120-12-7-----	Anthracene	2.8	_____
260-94-6-----	Acridine	5.5	U
86-74-8-----	Carbazole	33	_____
206-44-0-----	Fluoranthene	13	_____
129-00-0-----	Pyrene	11	_____
56-55-3-----	Benzo(a)Anthracene	4.8	U
218-01-9-----	Chrysene	5.3	U
207-08-9-----	Benzo(b)fluoranthene	4.8	U
205-08-9-----	Benzo(k)fluoranthene	4.4	U
192-97-2-----	Benzo(e)pyrene	3.6	U
50-32-8-----	Benzo(a)pyrene	4.4	U
198-55-0-----	Perylene	4.8	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	4.0	U
53-70-3-----	Dibenzo(a,h)anthracene	3.0	U
191-24-2-----	Benzo(g,h,i)perylene	5.3	U

1B  
SEMOVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP4D

Lab Name:	QUANTERRA DENVER	Contract:	
Lab Code:	Case No.: 51769	SAS No.:	SDG No.: 51769
Matrix:	(soil/water) WATER	Lab Sample ID:	51769-01DU
Sample wt/vol:	4200 (g/ml) ML	Lab File ID:	A1501041
Level:	(low/med) LOW	Date Received:	10/01/96
% Moisture:	_____ decanted: (Y/N) _____	Date Extracted:	10/02/96
Concentrated Extract Volume:	0.5 (ml)	Date Analyzed:	10/08/96
Injection Volume:	1.0 (uL)	Dilution Factor:	2.0
GPC Cleanup:	(Y/N) N	pH:	7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	9.7	U
496-11-7-----	2,3-Dihydroindene	200	_____
95-13-6-----	1H-Indene	11	_____
91-20-3-----	Naphthalene	12	U
95-15-8-----	Benzo(b)thiophene	58	_____
91-22-5-----	Quinoline	2.7	U
120-72-9-----	1H-Indole	4.8	U
91-57-6-----	2-Methylnaphthalene	1.7	U
90-12-0-----	1-Methylnaphthalene	3.0	U
92-52-4-----	Biphenyl	8.2	U
208-96-8-----	Acenaphthylene	2.7	U
83-32-9-----	Acenaphthene	190	_____
132-64-9-----	Dibenzofuran	1.9	U
86-73-7-----	Fluorene	1.9	U
132-65-0-----	Dibenzothiophene	2.2	_____
85-01-8-----	Phenanthrene	5.7	B
120-12-7-----	Anthracene	3.0	_____
260-94-6-----	Acridine	5.5	U
86-74-8-----	Carbazole	33	_____
206-44-0-----	Fluoranthene	13	_____
129-00-0-----	Pyrene	10	_____
56-55-3-----	Benzo(a)Anthracene	4.8	U
218-01-9-----	Chrysene	5.3	U
207-08-9-----	Benzo(b)fluoranthene	4.8	U
205-08-9-----	Benzo(k)fluoranthene	4.4	U
192-97-2-----	Benzo(e)pyrene	3.6	U
50-32-8-----	Benzo(a)pyrene	4.4	U
198-55-0-----	Perylene	4.8	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	4.0	U
53-70-3-----	Dibenzo(a,h)anthracene	3.0	U
191-24-2-----	Benzo(g,h,i)perylene	5.3	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP4FB

Name: QUANTERRA DENVER Contract:

Lab Code: Case No.: 51769 SAS No.: SDG No.: 51769

Matrix: (soil/water) WATER Lab Sample ID: 51769-02FB

Sample wt/vol: 3150 (g/ml) ML Lab File ID: A1101037

Level: (low/med) LOW Date Received: 10/01/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/02/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/08/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	6.5	U	
496-11-7-----	2,3-Dihydroindene	1.8	U	
95-13-6-----	1H-Indene	1.1	U	
91-20-3-----	Naphthalene	8.2	U	
95-15-8-----	Benzo(b)thiophene	1.1	U	
91-22-5-----	Quinoline	1.8	U	
120-72-9-----	1H-Indole	3.2	U	
91-57-6-----	2-Methylnaphthalene	1.5	B	
90-12-0-----	1-Methylnaphthalene	2.0	U	
92-52-4-----	Biphenyl	5.5	U	
208-96-8-----	Acenaphthylene	1.8	U	
83-32-9-----	Acenaphthene	1.6	U	
132-64-9-----	Dibenzofuran	1.3	U	
86-73-7-----	Fluorene	1.3	U	
132-65-0-----	Dibenzothiophene	1.4	U	
85-01-8-----	Phenanthrene	2.5	B	
120-12-7-----	Anthracene	1.4	U	
260-94-6-----	Acridine	3.7	U	
86-74-8-----	Carbazole	2.4	U	
206-44-0-----	Fluoranthene	1.8	U	
129-00-0-----	Pyrene	1.8	U	
56-55-3-----	Benzo(a)Anthracene	3.2	U	
218-01-9-----	Chrysene	3.6	U	
207-08-9-----	Benzo(b)Fluoranthene	3.2	U	
205-08-9-----	Benzo(k)fluoranthene	2.9	U	
192-97-2-----	Benzo(e)pyrene	2.4	U	
50-32-8-----	Benzo(a)pyrene	2.9	U	
198-55-0-----	Perylene	3.2	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.7	U	
53-70-3-----	Dibenzo(a,h)anthracene	2.0	U	
191-24-2-----	Benzo(g,h,i)perylene	3.6	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP4FBD

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 51769 SAS No.: SDG No.: 51769

Medium: (soil/water) WATER Lab Sample ID: 51769-02FBD

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A1201038

Extraction: (low/med) LOW Date Received: 10/01/96

Extraction: decanted: (Y/N) Date Extracted: 10/02/96

Extracted Extract Volume: 0.5 (ml) Date Analyzed: 10/08/96

Dilution Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	1.3	B
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorene	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.7	B
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)Fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMOVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP4MS

Lab Name: QUANTERRA DENVER Contract:

Lab Code: Case No.: 51769 SAS No.: SDG No.: 51769

Matrix: (soil/water) WATER Lab Sample ID: 51769-01MS

Sample wt/vol: 3150 (g/mL) ML Lab File ID: A0601051

Level: (low/med) LOW Date Received: 10/01/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/02/96

Concentrated Extract Volume: 0.5 (mL) Date Analyzed: 10/09/96

Injection Volume: 1.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	13	U	
496-11-7-----	2,3-Dihydroindene	190	_____	
95-13-6-----	1H-Indene	21	_____	
91-20-3-----	Naphthalene	16	J	
95-15-8-----	Benzo(b)thiophene	57	_____	
91-22-5-----	Quinoline	10	_____	
120-72-9-----	1H-Indole	6.3	U	
91-57-6-----	2-Methylnaphthalene	13	B	
90-12-0-----	1-Methylnaphthalene	4.1	U	
92-52-4-----	Biphenyl	11	U	
208-96-8-----	Acenaphthylene	3.6	U	
83-32-9-----	Acenaphthene	190	_____	
132-64-9-----	Dibenzofuran	2.5	U	
86-73-7-----	Fluorene	12	_____	
132-65-0-----	Dibenzothiophene	2.8	U	
85-01-8-----	Phenanthrene	7.6	B	
120-12-7-----	Anthracene	2.8	_____	
260-94-6-----	Acridine	7.4	U	
86-74-8-----	Carbazole	32	_____	
206-44-0-----	Fluoranthene	14	_____	
129-00-0-----	Pyrene	10	_____	
56-55-3-----	Benzo(a)Anthracene	6.3	U	
218-01-9-----	Chrysene	5.1	J	
207-08-9-----	Benzo(b)fluoranthene	6.3	U	
205-08-9-----	Benzo(k)fluoranthene	5.8	U	
192-97-2-----	Benzo(e)pyrene	4.8	U	
50-32-8-----	Benzo(a)pyrene	5.8	U	
198-55-0-----	Perylene	6.3	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	5.3	U	
53-70-3-----	Dibenzo(a,h)anthracene	4.1	U	
191-24-2-----	Benzo(g,h,i)perylene	7.1	U	

**1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET**

EPA SAMPLE NO.

PCJ-SLP4MSD

b Name: QUANTERRA DENVER Contract:  
 b Code: Case No.: 51769 SAS No.: SDG No.: 51769  
 Matrix: (soil/water) WATER Lab Sample ID: 51769-01MSD  
 Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0701052  
 Level: (low/med) LOW Date Received: 10/01/96  
 Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/02/96  
 Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/09/96  
 Injection Volume: 1.0 (uL) Dilution Factor: 2.0  
 PC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	Q
271-89-6-----	2,3-Benzofuran	9.7	U
496-11-7-----	2,3-Dihydroindene	170	_____
95-13-6-----	1H-Indene	18	_____
91-20-3-----	Naphthalene	12	J
95-15-8-----	Benzo(b)thiophene	52	_____
91-22-5-----	Quinoline	8.8	_____
120-72-9-----	1H-Indole	4.8	U
91-57-6-----	2-Methylnaphthalene	8.8	B
90-12-0-----	1-Methylnaphthalene	3.0	U
92-52-4-----	Biphenyl	8.2	U
208-96-8-----	Acenaphthylene	2.7	U
83-32-9-----	Acenaphthene	180	_____
132-64-9-----	Dibenzofuran	1.9	U
86-73-7-----	Fluorene	8.3	_____
132-65-0-----	Dibenzothiophene	2.1	U
85-01-8-----	Phenanthrene	5.3	B
120-12-7-----	Anthracene	2.6	_____
260-94-6-----	Acridine	5.5	U
86-74-8-----	Carbazole	31	_____
206-44-0-----	Fluoranthene	12	_____
129-00-0-----	Pyrene	9.3	_____
56-55-3-----	Benzo(a)Anthracene	4.8	U
218-01-9-----	Chrysene	3.4	J
207-08-9-----	Benzo(b)Fluoranthene	4.8	U
205-08-9-----	Benzo(k)fluoranthene	4.4	U
192-97-2-----	Benzo(e)pyrene	3.6	U
50-32-8-----	Benzo(a)pyrene	4.4	U
198-55-0-----	Perylene	4.8	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	4.0	U
53-70-3-----	Dibenzo(a,h)anthracene	3.0	U
191-24-2-----	Benzo(g,h,i)perylene	5.3	U

**2C**  
**WATER SEMIVOLATILE SURROGATE RECOVERY**

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 51769 SAS No.:

SDG No.: 51769

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	SBLK01	78	81	61						0
02	LCS	85	90	71						0
03	DPV-W121	58	12	74						0
04	DPV-W1	48	14	58						0
05	DPV-W20	OD	OD	OD						0
06	PCJ-SLP4FB	74	84	65						0
07	PCJ-SLP4FBD	84	101	71						0
08	PCJ-SLP4	81	45	72						0
09	PCJ-SLP4D	104	48	72						0
10	DPV-W22	OD	OD	OD						0
11	PCJ-SLP4MS	87	47	72						0
12	PCJ-SLP4MSD	83	41	72						0
13	DPV-W124	OD	OD	OD						0
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

**QC LIMITS**

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

<sup>3C</sup>  
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 51769

SAS Nc.:

SDG No.: 51769

Matrix Spike - EPA Sample No.: PCJ-SLP4

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	13	9.1	21	92	20-150
Naphthalene	13	0.00	16	123	20-150
Quinoline	13	0.00	10	77	20-150
2-Methylnaphthalene	13	0.00	13	100	20-150
Fluorene	13	0.00	12	92	69-118
Chrysene	13	0.00	5.1	39	20-132
Benzo(e)pyrene	13	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMITS RPD	REC.
1H-Indene	9.5	18	94	2	20	20-150
Naphthalene	9.5	12	126	2	20	20-150
Quinoline	9.5	8.8	93	19	20	20-150
2-Methylnaphthalene	9.5	8.8	93	7	20	20-150
Fluorene	9.5	8.3	87	6	20	69-118
Chrysene	9.5	3.4	36	8	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

RPD: 0 out of 7 outside limits

Spike Recovery: 2 out of 14 outside limits

COMMENTS: \_\_\_\_\_

**FORM 3**  
**WATER SEMIVOLATILE METHOD SPIKE RECOVERY**

Name: QUANTERRA DENVER

Contract:

• Code: Case No.: 51769 SAS No.: SDG No.: 51769  
Matrix Spike - CSLP Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
1H-Indene	10	8.3	83	20-150
Naphthalene	10	10	100	20-150
Quinoline	10	8.1	81	20-150
2-Methylnaphthalene	10	9.3	93	20-150
Fluorene	10	8.4	84	69-118
Chrysene	10	7.6	76	20-132
Benzo(e)pyrene	10	9.3	93	20-150

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

COMMENTS: \_\_\_\_\_

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LCS

b Name: QUANTERRA DENVER Contract: \_\_\_\_\_

b Code: Case No.: 51769 SAS No.: SDG No.: 51769

Matrix: (soil/water) WATER Lab Sample ID: 51769-LCS

Sample wt/vol: 4000 (g/ml) ML Lab File ID: A0201028

Level: (low/med) LOW Date Received: \_\_\_\_\_

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/02/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/08/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
95-13-6-----	1H-Indene _____	8.3	_____
91-20-3-----	Naphthalene _____	10	_____
91-22-5-----	Quinoline _____	8.1	_____
91-57-6-----	2-Methylnaphthalene _____	9.3	_____
86-73-7-----	Fluorene _____	8.4	_____
218-01-9-----	Chrysene _____	7.6	_____
192-97-2-----	Benzo(e)pyrene _____	9.3	_____

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

N : QUANTERRA DENVER

Contract:

Code: Case No.: 51769 SAS No.: SDG No.: 51769

File ID: A0101027

Lab Sample ID: SBLK01

Instrument ID: A

Date Extracted: 10/02/96

Mix: (soil/water) WATER

Date Analyzed: 10/08/96

Rel: (low/med) LOW

Time Analyzed: 1052

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	51769-LCS	A0201028	10/08/96
02 DPV-W121	51769-04	A0301029	10/08/96
03 DPV-W1	51769-05	A0401030	10/08/96
04 DPV-W20	51769-06	A1001036	10/08/96
05 PCJ-SLP4FB	51769-02FB	A1101037	10/08/96
06 PCJ-SLP4FBD	51769-02FBD	A1201038	10/08/96
07 PCJ-SLP4	51769-01	A1401040	10/08/96
08 PCJ-SLP4D	51769-01DU	A1501041	10/08/96
09 DPV-W22	51769-07	A0501050	10/09/96
10 PCJ-SLP4MS	51769-01MS	A0601051	10/09/96
11 PCJ-SLP4MSD	51769-01MSD	A0701052	10/09/96
12 DPV-W124	51769-03	A1001055	10/09/96
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
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25			
26			
27			
28			
29			
30			

COMMENTS:

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1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK01

e: QUANTERRA DENVER Contract: \_\_\_\_\_

e: Case No.: 51769 SAS No.: SDG No.: 51769

: (soil/water) WATER Lab Sample ID: SBLK01

wt/vol: 4000 (g/ml) ML Lab File ID: A0101027

(low/med) LOW Date Received: \_\_\_\_\_

ture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/02/96

Extracted Extract Volume: 0.5 (ml) Date Analyzed: 10/08/96

tion Volume: 1.0 (uL) Dilution Factor: 1.0

leanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	Q
271-89-6-----	2,3-Benzofuran	5.1	U
496-11-7-----	2,3-Dihydroindene	1.4	U
95-13-6-----	1H-Indene	0.90	U
91-20-3-----	Naphthalene	6.5	U
95-15-8-----	Benzo(b)thiophene	0.90	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.5	U
91-57-6-----	2-Methylnaphthalene	1.0	U
90-12-0-----	1-Methylnaphthalene	1.6	U
92-52-4-----	Biphenyl	4.3	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	1.0	U
86-73-7-----	Fluorene	1.0	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	1.5	U
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.9	U
86-74-8-----	Carbazole	1.9	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.5	U
218-01-9-----	Chrysene	2.8	U
207-08-9-----	Benzo(b)Fluoranthene	2.5	U
205-08-9-----	Benzo(k)fluoranthene	2.3	U
192-97-2-----	Benzo(e)pyrene	1.9	U
50-32-8-----	Benzo(a)pyrene	2.3	U
198-55-0-----	Perylene	2.5	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.8	U

8B  
SEMOVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER Contract:  
 ab Code: Case No.: 51769 SAS No.: SDG No.: 51769  
 ab File ID (Standard): A025 Date Analyzed: 10/08/96  
 nstrument ID: A Time Analyzed: 0831

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	129650	12.56	197117	15.01	56820	21.62
UPPER LIMIT	259300	13.06	394234	15.51	113640	22.12
LOWER LIMIT	64825	12.06	98558	14.51	28410	21.12
EPA SAMPLE NO.						
01 SBLK01	130470	12.56	190585	15.02	63037	21.62
02 LCS	127680	12.54	187293	15.00	62141	21.61
03 DPV-W121	174464	12.54	227452	15.00	107654	21.61
04 DPV-W1	193581	12.54	224631	15.00	109887	21.61
05 DPV-W20	106869	12.54	164915	15.00	58585	21.61
06 PCJ-SLP4FB	111740	12.54	166671	15.00	68055	21.60
07 PCJ-SLP4FBD	112471	12.54	159432	15.00	47452	21.60
08 PCJ-SLP4	126347	12.54	193769	15.00	60537	21.60
09 PCJ-SLP4D	119710	12.54	188648	15.00	57446	21.60
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
 AREA LOWER LIMIT = - 50% of internal standard area  
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 51769

SAS No.:

SDG No.: 51769

Lab File ID (Standard): A045

Date Analyzed: 10/09/96

Instrument ID: A

Time Analyzed: 0843

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	132436	12.53	177567	14.98	59150	21.58
UPPER LIMIT	264872	13.03	355134	15.48	118300	22.08
LOWER LIMIT	66218	12.03	88784	14.48	29575	21.08
EPA SAMPLE NO.						
01 DPV-W22	130929	12.50	187058	14.95	58011	21.56
02 PCJ-SLP4MS	112288	12.50	169450	14.95	61061	21.56
03 PCJ-SLP4MSD	124002	12.50	180652	14.95	60395	21.56
04 DPV-W124	129535	12.51	198803	14.96	83868	21.56
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

25

## WATER SEMIVOLATILE SURROGATE RECOVERY

3: QUANTERRA DENVER

**Contract:**

;de;

Case No.: 51769 SAS No.:

SDG No.: 51769

## QC LIMITS

S1 = Naphthalene-d<sub>8</sub> (21-108)  
 S2 = Chrysene-d<sub>12</sub> (10-118)  
 S3 = Fluorene-d<sub>10</sub> (41-162)

# Column to be used to flag recovery values  
\* Values outside of contract required QC limits  
D Surrogate diluted out

3C  
ER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 51769

SAS No.:

SDG No.: 51769

Six Spike - EPA Sample No.: PCJ-SLP4

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1-Indene	13	9.1	21	92	20-150
naphthalene	13	0.00	16	123	20-150
quinoline	13	0.00	10	77	20-150
2-Methylnaphthalene	13	0.00	13	100	20-150
fluorene	13	0.00	12	92	69-118
Chrysene	13	0.00	5.1	39	20-132
Benzo(e)pyrene	13	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMITS RPD	REC.
1H-Indene	9.5	18	94	2	20	20-150
Naphthalene	9.5	12	126	2	20	20-150
Quinoline	9.5	8.8	93	19	20	20-150
2-Methylnaphthalene	9.5	8.8	93	7	20	20-150
Fluorene	9.5	8.3	87	6	20	69-118
Chrysene	9.5	3.4	36	8	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

\* Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 7 outside limits

Spike Recovery: 2 out of 14 outside limits

COMMENTS: \_\_\_\_\_

**FORM 3**  
**WATER SEMIVOLATILE METHOD SPIKE RECOVERY**

Site: QUANTERRA DENVER

Contract:

Code: Case No.: 51769 SAS No.: SDG No.: 51769

Spike - CSLP Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
-Indene	10	8.3	83	20-150
naphthalene	10	10	100	20-150
inoline	10	8.1	81	20-150
Methylnaphthalene	10	9.3	93	20-150
uorene	10	8.4	84	69-118
rysene	10	7.6	76	20-132
nzo(e)pyrene	10	9.3	93	20-150

Column to be used to flag recovery and RPD values with an asterisk  
Values outside of QC limits

COMMENTS: \_\_\_\_\_

4B  
SEMICVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

☐ Name: QUANTERRA DENVER                      Contract:  
 ☐ Code:    Case No.: 51769    SAS No.:                              SDG No.: 51769  
 ☐ File ID: A0101027                              Lab Sample ID: SBLK01  
 ☐ Instrument ID: A                                Date Extracted: 10/02/96  
 ☐ Matrix: (soil/water) WATER                    Date Analyzed: 10/08/96  
 ☐ Level: (low/med) LOW                            Time Analyzed: 1052

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	51769-LCS	A0201028	10/08/96
02 DPV-W121	51769-04	A0301029	10/08/96
03 DPV-W1	51769-05	A0401030	10/08/96
04 DPV-W20	51769-06	A1001036	10/08/96
05 PCJ-SLP4FB	51769-02FB	A1101037	10/08/96
06 PCJ-SLP4FBD	51769-02FBD	A1201038	10/08/96
07 PCJ-SLP4	51769-01	A1401040	10/08/96
08 PCJ-SLP4D	51769-01DU	A1501041	10/08/96
09 DPV-W22	51769-07	A0501050	10/09/96
10 PCJ-SLP4MS	51769-01MS	A0601051	10/09/96
11 PCJ-SLP4MSD	51769-01MSD	A0701052	10/09/96
12 DPV-W124	51769-03	A1001055	10/09/96
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

COMMENTS:

---

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

Contract:

Job Code:

Case No.: 51769

SAS No.:

SDG No.: 51769

Job File ID (Standard): A025

Date Analyzed: 10/08/96

Instrument ID: A

Time Analyzed: 0831

	IS1(ANT) AREA #	RT #	IS2(PEN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	129650	12.56	197117	15.01	56820	21.62
UPPER LIMIT	259300	13.06	394234	15.51	113640	22.12
LOWER LIMIT	64825	12.06	98558	14.51	28410	21.12
EPA SAMPLE NO.						
01 SBLK01	130470	12.56	190585	15.02	63037	21.62
02 LCS	127680	12.54	187293	15.00	62141	21.61
03 DPV-W121	174464	12.54	227452	15.00	107654	21.61
04 DPV-W1	193581	12.54	224631	15.00	109887	21.61
05 DPV-W20	106869	12.54	164915	15.00	58585	21.61
06 PCJ-SLP4FB	111740	12.54	166671	15.00	68055	21.60
07 PCJ-SLP4FBD	112471	12.54	159432	15.00	47452	21.60
08 PCJ-SLP4	126347	12.54	193769	15.00	60537	21.60
09 PCJ-SLP4D	119710	12.54	188648	15.00	57446	21.60
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PEN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

5 Name: QUANTERRA DENVER

Contract:

5 Code:

Case No.: 51769

SAS No.:

SDG No.: 51769

5 File ID (Standard): A045

Date Analyzed: 10/09/96

Instrument ID: A

Time Analyzed: 0843

	IS1(ANT) AREA #	RT #	IS2(PEN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	132436	12.53	177567	14.98	59150	21.58
UPPER LIMIT	264872	13.03	355134	15.48	118300	22.08
LOWER LIMIT	66218	12.03	88784	14.48	29575	21.08
EPA SAMPLE NO.						
01 DPV-W22	130929	12.50	187058	14.95	58011	21.56
02 PCJ-SLP4MS	112288	12.50	169450	14.95	61061	21.56
03 PCJ-SLP4MSD	124002	12.50	180652	14.95	60395	21.56
04 DPV-W124	129535	12.51	198803	14.96	83868	21.56
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PEN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

## **PHENOLICS MONITORING**

## **INORGANIC ANALYSIS DATA SHEET**

**Client ID**

PCJ-SLP4TP-071596

**Laboratory Name:** Quanterra Denver

**Contract: City of St. Louis Park**

**Matrix (soil/water): Aqueous**

**Level (low/med): Low**

**% Solids:** N/A

Lab Sample ID: 50225-0008-SA

Date Received: 7/16/96

**Concentration Units (ug/L or mg/kg dry weight):** UG/L

**Color Before:** Colorless  
**Color After:** Colorless

## **Clarity Before: Clarity After:**

**Clear**

## Texture: Artifacts:

### **Comments:**

## RAP SECTION 7.3(B) MONITORING

WELL  
W23

## **FIRST HALF MONITORING**

1B  
SEMOVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

PCJ-W23

Lab Code:	Case No.: 48342	SAS No.:	SDG No.: 48342
Matrix: (soil/water) WATER	Lab Sample ID: 48342-06		
Sample wt/vol:	1060 (g/ml) ML	Lab File ID: T0601712	
Level: (low/med)	LOW	Date Received: 04/16/96	
% Moisture:	decanted: (Y/N)	Date Extracted: 04/19/96	
Concentrated Extract Volume:	1.0 (ml)	Date Analyzed: 04/22/96	
Injection Volume:	2.0 (uL)	Dilution Factor: 1.0	
GPC Cleanup: (Y/N) N	pH: 7.0		

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

91-20-3-----	Naphthalene	14.2	
91-57-6-----	2-Methylnaphthalene	2.32	J
208-96-8-----	Acenaphthylene	9.43	U
83-32-9-----	Acenaphthene	7.18	J
132-64-9-----	Dibenzofuran	2.26	J
86-73-7-----	Fluorene	5.48	J
85-01-8-----	Phenanthrene	3.41	J
120-12-7-----	Anthracene	9.43	U
206-44-0-----	Fluoranthene	2.76	J
129-00-0-----	Pyrene	2.95	J
56-55-3-----	Benzo(a)Anthracene	9.43	U
218-01-9-----	Chrysene	9.43	U
205-99-2-----	Benzo(b)fluoranthene	9.43	U
207-08-9-----	Benzo(k)fluoranthene	9.43	U
50-32-8-----	Benzo(a)pyrene	9.43	U
193-39-5-----	Indeno(1 2 3-cd)pyrene	9.43	U
53-70-3-----	Dibenzo(a h)anthracene	9.43	U
191-24-2-----	Benzo(g h i)perylene	9.43	U
86-74-8-----	Carbazole	9.43	U
95-13-6-----	1H-Indene	9.43	U
91-22-5-----	Quinoline	9.43	U
90-12-0-----	1-Methylnaphthalene	3.18	J
271-89-6-----	2,3-Benzofuran	9.43	U
496-11-7-----	2,3-Dihydroindene	2.99	J
95-15-8-----	Benzo(b)thiophene	9.43	U
120-72-9-----	1H-Indole	9.43	U
92-52-4-----	Biphenyl	1.15	J
132-65-0-----	Dibenzothiophene	9.43	U
260-94-6-----	Acridine	9.43	U
192-97-2-----	Benzo(e)pyrene	9.43	U
198-55-0-----	Perylene	9.43	U

## **SECOND HALF MONITORING**

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-W23

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 50226

SAS No.:

SDG No.: 50226

Matrix: (soil/water) WATER

Lab Sample ID: 50226-09

Sample wt/vol: 1060 (g/ml) ML

Lab File ID: E2087

Level: (low/med) LOW

Date Received: 07/16/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 07/19/96

Concentrated Extract Volume: 1.0 (ml)

Date Analyzed: 07/25/96

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

CAS NO.	COMPOUND	UG/L	Q
91-20-3-----	Naphthalene	14	
91-57-6-----	2-Methylnaphthalene	2.4	J
208-96-8-----	Acenaphthyliene	9.4	U
83-32-9-----	Acenaphthene	7.1	J
132-64-9-----	Dibenzofuran	2.3	J
86-73-7-----	Fluorene	5.2	J
85-01-8-----	Phenanthrene	3.2	J
120-12-7-----	Anthracene	9.4	U
206-44-0-----	Fluoranthene	3.4	J
129-00-0-----	Pyrene	3.2	J
56-55-3-----	Benzo (a) Anthracene	9.4	U
218-01-9-----	Chrysene	9.4	U
205-99-2-----	Benzo (b) fluoranthene	9.4	U
207-08-9-----	Benzo (k) fluoranthene	9.4	U
50-32-8-----	Benzo (a) pyrene	9.4	U
193-39-5-----	Indeno(1 2 3-cd)pyrene	9.4	U
53-70-3-----	Dibenz(a h)anthracene	9.4	U
191-24-2-----	Benzo(g h i)perylene	9.4	U
86-74-8-----	Carbazole	9.4	U
95-13-6-----	1H-Indene	9.4	U
91-22-5-----	Quinoline	9.4	U
90-12-0-----	1-Methylnaphthalene	3.3	J
271-89-6-----	2,3-Benzofuran	9.4	U
496-11-7-----	2,3-Dihydroindene	2.9	J
95-15-8-----	Benzo (b) thiophene	9.4	U
120-72-9-----	1H-Indole	9.4	U
92-52-4-----	Biphenyl	1.2	J
132-65-0-----	Dibenzothiophene	9.4	U
260-94-6-----	Acridine	9.4	U
192-97-2-----	Benzo(e)pyrene	9.4	U
198-55-0-----	Perylene	9.4	U

## RAP SECTION 7.3(C) MONITORING

### WELLS

SLP6

SLP7

13  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP7

Name: QUANTERRA DENVER Contract:

Code: Case No.: 49403 SAS No.: SDG No.: 49403

Mat: (soil/water) WATER Lab Sample ID: 49403-06

ple wt/vol: 41.96 (g/mL) ML Lab File ID: A0601291

el: (low/med) LOW Date Received: 06/05/96

picture: \_\_\_\_\_ Date Extracted: 06/07/96

Saturated Extract Volume: 0.5 (mL) Date Analyzed: 07/16/96

action Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	2.8	
95-13-6-----	1E-Indene	0.86	U
91-20-3-----	Naphthalene	6.7	
95-15-8-----	Benzo(b) thiophene	0.86	U
91-22-3-----	Quinoline	1.3	U
120-72-9-----	1E-Indole	2.4	U
91-57-6-----	1-Methylnaphthalene	1.7	
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
206-96-8-----	Acenaphthylene	1.8	
83-32-9-----	Acenaphthene	4.5	
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorane	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
65-01-8-----	Phenanthrene	3.1	
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.8	
56-55-3-----	Benzo(a) Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b) fluoranthene	2.4	U
205-08-9-----	Benzo(k) fluoranthene	2.2	U
192-97-2-----	Benzo(e) pyrene	1.8	U
50-32-8-----	Benzo(a) pyrene	2.2	U
193-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd) pyrene	2.0	U
53-70-3-----	Dibenzo(a,h) anthracene	1.5	U
131-24-2-----	Benzo(g,h,i) perylene	2.7	U

<sup>1B</sup>  
SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP6

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49403

SAS No.:

SDG No.: 49403

Matrix: (soil/water) WATER

Lab Sample ID: 49403-07

Sample wt/vol: 4200 (g/ml) ml

Lab File ID: A0501290

Level: (low/med) LOW

Date Received: 06/05/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/07/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/16/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

271-89-6-----	2,3-Benzofuran		4.8	C
496-11-7-----	2,3-Dihydroindene		5.0	
95-13-6-----	1H-Indene		6.2	
91-20-3-----	Naphthalene		7.3	
96-15-8-----	Benzo(b)thiophene		7.0	
91-22-5-----	Quinoline		1.4	
120-72-9-----	1H-Indole		2.4	
91-57-6-----	2-Methylnaphthalene		1.4	
90-12-0-----	1-Methylnaphthalene		1.5	
92-52-4-----	Biphenyl		4.1	C
208-96-8-----	Acenaphthylene		20	
83-32-9-----	Acenaphthene		53	
132-64-9-----	Dibenzofuran		5.4	
66-73-7-----	Fluorene		1.7	
132-65-0-----	Dibenzothiophene		1.0	
85-01-8-----	Phenanthrene		7.2	
120-12-7-----	Anthracene		1.0	
260-94-6-----	Acridine		3.1	
85-74-8-----	Carbazole		1.8	
206-44-0-----	Fluoranthene		1.4	
129-00-0-----	Pyrene		1.3	
56-55-3-----	Benzo(a)Anthracene		2.4	
218-01-9-----	Chrysene		2.7	
207-08-9-----	Benzo(b)Fluoranthene		2.4	
205-08-9-----	Benzo(k)fluoranthene		2.2	
192-97-2-----	Benzo(e)pyrene		1.8	
50-32-8-----	Benzo(a)pyrene		2.2	
198-55-0-----	Perylene		2.4	
193-39-5-----	Indeno(1,2,3-CD)pyrene		2.0	
53-70-3-----	Dibenzo(a,h)anthracene		1.5	
191-24-2-----	Benzo(g,h,i)perylene		2.7	

1314

## RAP SECTION 7.3 (D) MONITORING

### WELLS

SLP10 SLP14 SLP16  
W119 W402 W403  
W406



Quanterra Incorporated  
4955 Karrow Street  
Arvada, Colorado 80002

303-421-6611 Telephone  
303-431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

July 25, 1996

Quanterra Environmental Services

Project Number 049501

### Introduction

Nine aqueous samples (*including matrix QC*) were received at Quanterra Environmental Services, Denver Laboratory on June 11, 1996. The samples were logged in under Quanterra Denver's project number 049501. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

### Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

Client samples with lab Id's 049501-001, 001DU, 001MS, 001MSD, 004 and 005 had to be diluted due to target analytes exceeding the linear range of the instrument. The reporting limits were raised accordingly. As a result of dilution the surrogates for these samples were not detected and are reported as "D."

The spike compounds chrysene and benzo (e) pyrene in both the matrix spike and matrix spike duplicate samples were reported at 0% recovery. The spike compound fluorene in the matrix spike is reported at 316% recovery. The LCS and method blank associated with these samples are within acceptance criteria stated in the QAPP. Matrix interference is suspected and the data is considered valid.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By:

Date:

Kurt C. III  
Program Manager

Reviewed By:

Date:

## QUALIFIER CODES AND THEIR USAGE

A = This flag indicates that a TIC is a suspected addi-condensation product.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a true blank or a positively identified target compound.

C = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users to any discrepancies between the concentrations reported may be due to dilution of the sample or extract.

E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed according to the specifications in exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, the the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.

J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

QUALIFIER CODES AND THEIR USAGE  
Page Two

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

S = The concentration of this compound saturated the capacity of the detector and a valid quantitation could not be obtained at this dilution.

U = Indicates compound was analyzed for, but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.

X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".

R = Target compound's secondary ion confirmation not met, however peak shape and retention time make peak identification positive.

ANALYTICAL TEST REQUESTS  
for  
City of St. Louis Park

Lab ID: 049501	Group Code	Analysis Description	Custom Test?
0001 - 0005	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N
0002	B	Prep - PAH/SIM by GC/MS Low Level Polynuclear Aromatic Hydrocarbons, SIM Low Level	N

SAMPLE DESCRIPTION INFORMATION  
for  
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Received Time	Received Date
049501-0001-SA	PCJ-SLP10-061096	AQUEOUS	10 JUN 96		11 JUN 96
049501-0001-DU	PCJ-SLP10D-061096	AQUEOUS	10 JUN 96		11 JUN 96
049501-0001-MS	PCJ-SLP10MS-061096	AQUEOUS	10 JUN 96		11 JUN 96
049501-0001-SD	PCJ-SLP10MSD-061096	AQUEOUS	10 JUN 96		11 JUN 96
049501-0002-FB	PCJ-SLP10FB-061096	AQUEOUS	10 JUN 96		11 JUN 96
049501-0002-FD	PCJ-SLP10FBD-061096	AQUEOUS	10 JUN 96		11 JUN 96
049501-0003-SA	PCJ-W29-061096	AQUEOUS	10 JUN 96	11:45	11 JUN 96
049501-0004-SA	PCJ-W40-061096	AQUEOUS	10 JUN 96	11:20	11 JUN 96
049501-0005-SA	PCJ-W70-061096	AQUEOUS	10 JUN 96	12:10	11 JUN 96

QIANTERRA CLIENT				SAMPLE SAFE™ CONDITIONS			
PROJECT	City of St. Louis Park 3752 Wooddale Ave So St. Louis Park Mn 55416			PACKED BY <i>BB</i>	SEAL NUMBER		
SAMPLING COMPANY				SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY		CONDITION OF CONTENTS	
SAMPLING SITE				SEALED FOR SHIPPING BY <i>BB</i>		INITIAL CONTENTS TEMP.	
TEAM LEADER				SEAL NUMBER	SAMPLING STATUS	<input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
				SEAL INTACT UPON RECEIPT BY LAB. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. <i>5.7 °C</i>	
DATE	TIME	SAMPLE ID/DESCRIPTION		SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6/10/96		PCJ-SLP 10 - 061096		IXL AMBER	6	PPT PAH	PPT 5 -01
6/10/96		PCJ-SLP 10D - 061096		IXL AMBER	6	PPT PAH	PPT 5 -01 Dn
CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>BB</i>			
				METHOD OF SHIPMENT <i>FED EX</i>		AIRBILL NUMBER <i>7828345641</i>	
				RECEIVED FOR LAB <i>OES</i>	SIGNED <i>J. Peltz</i>	DATE/TIME <i>6/11/96 9:00</i>	
				QUANTERRA PROJECT NUMBER <i>49501</i>			

---

QUANTERRA CLIENT

## PROJECT

**SAMPLING COMPANY**

SAND  
SAMPLING SITE

TEAM LEADER

80

## **CUSTODY TRANSFERS PRIOR TO SHIPPING**

#### **SHIPPING DETAILS**

**RElinquished By (Signed)**

RECEIVED BY (SIGNED)

DAT

11

DELIVERED TO SHIPPER BY

3

**METHOD OF SHIPMENT**

**AIRBILL NUMBER**

7828345641

DATE/TIME  
6/11/96 9:00

**RECEIVED FOR LAB**

四

SIGNER

J. D. Ochs

**QUANTERRA PROJECT NUMBER**

QUANTERRA CLIENT

PROJECT

SAMPLING COMPANY

SAMPLING SITE

TEAM LEADER

# Chain of Custody Record

Environmental  
Services

QUA-4124-1

Client

**Chain of Custody  
Records**

The logo for Quanterra Environmental Services. It features the word "Quanterra" in a bold, italicized, lowercase sans-serif font. A stylized graphic element resembling a globe or a series of concentric ellipses is positioned to the left of the letter "Q". To the right of "Quanterra" is a circular graphic element containing a dark, textured shape.

QUA-4124-1

Client Address City Project Name		Project Manager Telephone Number (Area Code)/Fax Number		Date Lab Number	Chain Of Custody Number							
City Of St Louis Park 3752 Woodchuk Ave St Louis Park MN 55416 SLP		Bill Gregg 612-924-0112		6/10/96	66207							
Contract/Purchase Order/Quote No.		Site Contact Carrier/Waybill Number	Lab Contact	Analysis (Attach list if more space is needed)								
		Scott Anderson										
Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Matrix		Containers & Preservatives						Special Instructions/ Conditions of Receipt  PP1-5 -5		
		Auger	Sed.	Soil	Ungas	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH		ZnAc	NaOH
PC J-W 20-06/10/96	6/10/96	12:10 X	6		X							
Possible Hazard Identification		Sample Disposal		(A fee may be assessed if samples are retained								
<input type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input checked="" type="checkbox"/> Unknown	<input type="checkbox"/> Return To Client	<input checked="" type="checkbox"/> Disposal By Lab	<input type="checkbox"/> Archive For	Months longer than 3 months)				
Turn Around Time Required												
<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 7 Days	<input type="checkbox"/> 14 Days	<input type="checkbox"/> 21 Days	<input checked="" type="checkbox"/> Other	Signature						
1 Relinquished By		Date	Time		1. Received By		Date		Time			
<i>J. Decker</i>		6/10/96			<i>J. Decker</i>		6/11/96		9:00			
2 Relinquished By		Date	Time		2. Received By		Date		Time			
3 Relinquished By		Date	Time		3. Received By		Date		Time			

**DISTRIBUTION:** WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

1B  
SEMI VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP10

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Matrix: (soil/water) WATER

Lab Sample ID: 49501-01

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: A0101277

eval: (low/med) LOW

Date Received: 06/11/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/11/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/15/96

Injection Volume: 1.0 (uL)

Dilution Factor: 5.0

PC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND			
271-89-6-----	2,3-Benzofuran	24	U	
496-11-7-----	2,3-Dihydroindene	360		
95-13-6-----	1H-Indene	12		
91-20-3-----	Naphthalene	31	U	
95-15-8-----	Benzo(b)thiophene	40		
91-22-5-----	Quinoline	6.7	U	
120-72-9-----	1H-Indole	12	U	
91-57-6-----	2-Methylnaphthalene	4.3	U	
90-12-0-----	1-Methylnaphthalene	7.6	U	
92-52-4-----	Biphenyl	26		
208-96-8-----	Acenaphthylene	160		
83-32-9-----	Acenaphthene	660		
132-64-9-----	Dibenzofuran	26		
86-73-7-----	Fluorene	230		
132-65-0-----	Dibenzothiophene	27		
85-01-8-----	Phenanthrene	6.2		
120-12-7-----	Anthracene	5.2	U	
260-94-6-----	Acridine	14	U	
86-74-8-----	Carbazole	9.0	U	
206-44-0-----	Fluoranthene	40		
129-00-0-----	Pyrene	64		
56-55-3-----	Benzo(a)Anthracene	12	U	
218-01-9-----	Chrysene	13		
207-08-9-----	Benzo(b) Fluoranthene	12		
205-08-9-----	Benzo(k) fluoranthene	11		
192-97-2-----	Benzo(e) pyrene	9.0	U	
50-32-8-----	Benzo(a) pyrene	11		
193-55-0-----	Perylene	12		
193-39-5-----	Indeno(1,2,3-cd) pyrene	10		
53-70-3-----	Dibenzo(a,h)anthracene	7.6	U	
191-24-2-----	Benzo(g,h,i)perylene	13	U	

## 13 SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. \_\_\_\_\_

Lab Name: QUANTERRA DENVER  
Lab Code: Case No.: 49501 SAS No.: 49501

SQUEEZE

SDG No.: 49501

Matrix: (soil/water) water Lab Sample ID: 49501-01DU

Sample wt/vol: 4200 (g/ml) NC Lab File ID: A0201278

Level: (Low/mid) LOW Date Received: 06/11/96

% Moisture: decanted: (%/ml) \_\_\_\_\_ Date Extracted: 06/11/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/15/96

Injection Volume: 1.0 (uL) Dilution Factor: 5.0

GC Cleanup: (%/N) N DE: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/kg) NG/L Q

CAS NO. COMPOUND

271-89-6	2,3-Benzoquinone
249-61-7	2,3-Dihydroindene
93-13-6	1-E-Indene
93-20-3	Naphthalene
93-15-8	Benzo(5)thiophene
93-22-5	Oxindoline
93-20-7	E-Indole
93-57-6	2-Methylnaphthalene
93-12-0	1-Methylnaphthalene
93-52-4	Biphenyl
92-96-8	Acenaphthylene
93-32-9	Acenaphthene
93-54-9	Dibenzofuran
93-73-7	Fluorene
93-32-0	Dibenzothiophene
93-01-8	Phenanthrene
93-20-12-7	Anthracene
260-94-6	Acridine
86-74-8	Carbazole
206-44-0	Fluoranthene
129-00-0	Pyrene
156-55-3	Benzo(a)anthracene
218-01-9	Chrysene
207-08-9	Benzo(b)fluoranthene
205-08-9	Benzo(k)fluoranthene
93-92-9	Benzo(e)pyrene
93-32-8	Benzo(a)pyrene
93-98-5	Perylene
93-29-5	Indeno(1,2,3-CD)pyrene
93-70-3	Dibenzo(a,h)anthracene
91-24-2	Benzo(g,h,i)perylene

13  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP10FB

Lab Name: QUANTERRA DENVER

Contract:

La Code: Case No.: 49501 SAS No.: SDG No.: 49501

Matrix: (soil/water) WATER Lab Sample ID: 49501-02FB

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0501268

Level: (low/med) LOW Date Received: 06/11/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/11/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/12/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND			
271-89-6-----	2,3-Benzofuran	4.8	U	
496-11-7-----	2,3-Dihydroindene	1.3	U	
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	2.6		
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.95	U	
86-73-7-----	Fluorene	0.95	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	2.3	B	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(s,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

SLP10FBD

Lab Code: Case No.: 49501 SAS No.: SDG No.: 49501

Matrix: (soil/water) WATER Lab Sample ID: 49501-02FD

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0601269

Level: (low/med) LOW Date Received: 06/11/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/11/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/12/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

HPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.6	U
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorene	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	2.1	B
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	SBLK01	74	86	66						0
02	LCS	75	94	77						0
03	SLP10FB	62	81	62						0
04	SLP10FBD	70	85	68						0
05	W29	66	44	68						0
06	SLP10	OD	OD	OD						0
07	SLP10D	OD	OD	OD						0
08	SLP10MS	OD	OD	OD						0
09	W40	OD	OD	OD						0
10	SLP10MSD	OD	OD	OD						0
11	W70	OD	OD	OD						0
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

3C  
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

ab Name: QUANTERRA DENVER

Contract:

ab Code:

Case No.: 49501 SAS No.:

SDG No.: 49501

matrix Spike - EPA Sample No.: SLP10

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	12	20	84	20-150
Naphthalene	9.5	0.00	11	116	20-150
Quinoline	9.5	0.00	14	147	20-150
2-Methylnaphthalene	9.5	0.00	8.7	92	20-150
Fluorene	9.5	230	260	316*	69-118
Chrysene	9.5	0.00	0.00	0*	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC RPD	LIMITS REC.
1H-Indene	9.5	18	63	28*	20	20-15
Naphthalene	9.5	11	116	0	20	20-150
Quinoline	9.5	15	158*	7	20	20-150
2-Methylnaphthalene	9.5	8.7	92	0	20	20-150
Fluorene	9.5	240	105	100*	20	69-118
Chrysene	9.5	0.00	0*		20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

Column to be used to flag recovery and RPD values with an asterisk  
Values outside of QC limits

D: 2 out of 7 outside limits

Like Recovery: 6 out of 14 outside limits

MENTS:

**1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET**

EPA SAMPLE NO.

SLP10MS

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Matrix: (soil/water) WATER

Lab Sample ID: 49501-01MS

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: A0301279

Level: (low/med) LOW

Date Received: 06/11/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/11/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/15/96

Injection Volume: 1.0 (uL)

Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: 7.0

**CONCENTRATION UNITS:**  
(ug/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	24 U
496-11-7-----	2,3-Dihydroindene	390 _____
95-13-6-----	1H-Indene	20 _____
91-20-3-----	Naphthalene	11 _____
95-15-8-----	Benzo(b)thiophene	40 _____
91-22-5-----	Quinoline	14 _____
120-72-9-----	1H-Indole	12 U
91-57-6-----	2-Methylnaphthalene	8.7 _____
90-12-0-----	1-Methylnaphthalene	8.7 _____
92-52-4-----	Biphenyl	26 _____
208-96-8-----	Acenaphthylene	170 _____
83-32-9-----	Acenaphthene	700 _____
132-64-9-----	Dibenzofuran	26 _____
86-73-7-----	Fluorene	260 _____
132-65-0-----	Dibenzothiophene	30 _____
85-01-8-----	Phenanthrene	6.2 U
120-12-7-----	Anthracene	5.2 U
260-94-6-----	Acridine	14 U
86-74-8-----	Carbazole	9.0 U
206-44-0-----	Fluoranthene	42 _____
129-00-0-----	Pyrene	64 _____
56-55-3-----	Benzo(a)Anthracene	12 U
218-01-9-----	Chrysene	13 U
207-08-9-----	Benzo(b)fluoranthene	12 U
205-08-9-----	Benzo(k)fluoranthene	11 U
192-97-2-----	Benzo(e)pyrene	9.0 U
50-32-8-----	Benzo(a)pyrene	11 U
198-55-0-----	Perylene	12 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10 U
53-70-3-----	Dibenzo(a,h)anthracene	7.6 U
191-24-2-----	Benzo(g,h,i)perylene	13 U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

SLP10MSD

Lab Code: Case No.: 49501 SAS No.: SDG No.: 49501

Matrix: (soil/water) WATER Lab Sample ID: 49501-01MSD

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A1101296

Level: (low/med) LOW Date Received: 06/11/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/11/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/16/96

Injection Volume: 1.0 (uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	U
271-89-6-----	2,3-Benzofuran	24	U
496-11-7-----	2,3-Dihydroindene	360	_____
95-13-6-----	1H-Indene	18	_____
91-20-3-----	Naphthalene	11	_____
95-15-8-----	Benzo(b)thiophene	37	_____
91-22-5-----	Quinoline	15	_____
120-72-9-----	1H-Indole	12	U
91-57-6-----	2-Methylnaphthalene	8.7	_____
90-12-0-----	1-Methylnaphthalene	8.1	_____
92-52-4-----	Biphenyl	25	_____
208-96-8-----	Acenaphthylene	170	_____
83-32-9-----	Acenaphthene	650	_____
132-64-9-----	Dibenzofuran	26	_____
86-73-7-----	Fluorene	240	_____
132-65-0-----	Dibenzothiophene	30	_____
85-01-8-----	Phenanthrene	6.2	U
120-12-7-----	Anthracene	5.2	U
260-94-6-----	Acridine	14	U
86-74-8-----	Carbazole	9.0	U
206-44-0-----	Fluoranthene	44	_____
129-00-0-----	Pyrene	69	_____
56-55-3-----	Benzo(a)Anthracene	12	U
218-01-9-----	Chrysene	13	U
207-08-9-----	Benzo(b)fluoranthene	12	U
205-08-9-----	Benzo(k)fluoranthene	11	U
192-97-2-----	Benzo(e)pyrene	9.0	U
50-32-8-----	Benzo(a)pyrene	11	U
198-55-0-----	Perylene	12	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10	U
53-70-3-----	Dibenzo(a,h)anthracene	7.6	U
191-24-2-----	Benzo(g,h,i)perylene	13	U

FORM 3  
WATER SEMIVOLATILE METHOD SPIKE RECOVERY

Name: QUANTERRA DENVER Contract:  
 Lab Code: Case No.: 49501 SAS No.: SDG No.: 49501  
 Matrix Spike - Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
1H-Indene	10	7.0	70	20-150
Naphthalene	10	9.1	91	20-150
Quinoline	10	7.0	70	20-150
2-Methylnaphthalene	10	8.6	86	20-150
Fluorene	10	8.5	85	69-118
Chrysene	10	7.0	70	20-132
Benzo(e)pyrene	10	10	100	20-150

Column to be used to flag recovery and RPD values with an asterisk  
 Values outside of QC limits

COMMENTS: \_\_\_\_\_

13  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

49501-LCS

c Name: QUANTERRA DENVER Contract: \_\_\_\_\_  
 c Code: Case No.: 49501 SAS No.: SDG No.: 49501  
 Matrix: (soil/water) WATER Lab Sample ID: 49501-LCS  
 Sample wt/vol: 4000 (g/ml) ML Lab File ID: A263  
 Level: (low/med) LOW Date Received: \_\_\_\_\_  
 Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/11/96  
 Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/12/96  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	5.1 U
496-11-7-----	2,3-Dihydroindene	1.4 U
95-13-6-----	1H-Indene	7.0 _____
91-20-3-----	Naphthalene	9.1 _____
95-15-8-----	Benzo(b)thiophene	0.90 U
91-22-5-----	Quincline	7.0 _____
120-72-9-----	1H-Indole	2.5 U
91-57-6-----	2-Methylnaphthalene	8.6 _____
90-12-0-----	1-Methylnaphthalene	1.6 U
92-52-4-----	Biphenyl	4.3 U
208-96-8-----	Acenaphthylene	1.4 U
83-32-9-----	Acenaphthene	1.3 U
132-64-9-----	Dibenzofuran	1.0 U
86-73-7-----	Fluorene	8.5 _____
132-65-0-----	Dibenzothiophene	1.1 U
85-01-8-----	Phenanthrene	2.2 _____
120-12-7-----	Anthracene	1.1 U
260-94-6-----	Acridine	2.9 U
86-74-8-----	Carbazole	1.9 U
206-44-0-----	Fluoranthene	1.4 U
129-00-0-----	Pyrene	1.4 U
56-55-3-----	Benzo(a)Anthracene	2.5 U
218-01-9-----	Chrysene	7.0 _____
207-08-9-----	Benzo(b)fluoranthene	2.5 U
205-08-9-----	Benzo(k)fluoranthene	2.3 U
192-97-2-----	Benzo(e)pyrene	10 _____
50-32-8-----	Benzo(a)pyrene	2.3 U
198-55-0-----	Perylene	2.5 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1 U
53-70-3-----	Dibenzo(a,h)anthracene	1.6 U
191-24-2-----	Benzo(g,h,i)perylene	2.8 U

4B  
SEMICVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01
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No.: QUANTERRA DENVER

Contract:

Case: Case No.: 49501 SAS No.: SDG No.: 49501

File ID: A262 Lab Sample ID: SBLK01

Instrument ID: A Date Extracted: 06/11/96

Matrix: (soil/water) WATER Date Analyzed: 07/12/96

Matrix (low/med) LOW Time Analyzed: 1308

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	49501-LCS	A263	07/12/96
02 SLP10FB	49501-02FB	A0501268	07/12/96
03 SLP10FBD	49501-02FD	A0601269	07/12/96
04 W29	49501-03	A0701270	07/12/96
05 SLP10	49501-01	A0101277	07/15/96
06 SLP10D	49501-01DU	A0201278	07/15/96
07 SLP10MS	49501-01MS	A0301279	07/15/96
08 W40	49501-04	A0501281	07/15/96
09 SLP10MSD	49501-01MSD	A1101296	07/16/96
10 W70	49501-05	A1301298	07/16/96
11			
12			
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1 of 1

FORM IV SV

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<sup>1B</sup>  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK01

Lab Name: QUANTERRA DENVER Contract: \_\_\_\_\_  
 Lab Sample ID: SBLK01  
 ab Code: Case No.: 49501 SAS No.: SDG No.: 49501  
 atrix: (soil/water) WATER Lab Sample ID: SBLK01  
 ample wt/vol: 4000 (g/ml) ML Lab File ID: A262  
 evel: (low/med) LOW Date Received: \_\_\_\_\_  
 Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/11/96  
 ncentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/12/96  
 njection Volume: 1.0 (uL) Dilution Factor: 1.0  
 PC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	5.1	U
496-11-7-----	2,3-Dihydroindene	1.4	U
95-13-6-----	1H-Indene	0.90	U
91-20-3-----	Naphthalene	6.5	U
95-15-8-----	Benzo(b)thiophene	0.90	U
91-22-5-----	Quincline	1.4	U
120-72-9-----	1H-Indole	2.5	U
91-57-6-----	2-Methylnaphthalene	0.90	U
90-12-0-----	1-Methylnaphthalene	1.6	U
92-52-4-----	Biphenyl	4.3	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	1.0	U
86-73-7-----	Fluorene	1.0	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	2.0	U
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.9	U
86-74-8-----	Carbazole	1.9	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.5	U
218-01-9-----	Chrysene	2.8	U
207-08-9-----	Benzo(b)fluoranthene	2.5	U
205-08-9-----	Benzo(k)fluoranthene	2.3	U
192-97-2-----	Benzo(e)pyrene	1.9	U
50-32-8-----	Benzo(a)pyrene	2.3	U
198-55-0-----	Perylene	2.5	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.8	U

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Lab File ID (Standard): A261

Date Analyzed: 07/12/96

Instrument ID: A

Time Analyzed: 1207

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	107057	12.13	172395	14.53	118397	21.14
UPPER LIMIT	214114	12.63	344790	15.03	236794	21.64
LOWER LIMIT	53528	11.63	86198	14.03	59198	20.64
EPA SAMPLE NO.						
01 SBLK01	111738	12.14	204215	14.54	180937	21.15
02 49501-LCS	120659	12.13	215656	14.54	149305	21.15
03 SLP10FB	126977	12.13	228820	14.53	142183	21.14
04 SLP10FBD	121479	12.13	217286	14.53	153157	21.14
05 W29	121567	12.13	215586	14.53	159936	21.14
06						
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20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Lab File ID (Standard): A276

Date Analyzed: 07/15/96

Instrument ID: A

Time Analyzed: 1223

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	86778	12.09	142267	14.49	119123	21.11
UPPER LIMIT	173556	12.59	284534	14.99	238246	21.61
LOWER LIMIT	43389	11.59	71134	13.99	59562	20.61
EPA SAMPLE NO.						
01 SLP10	99150	12.09	174251	14.49	121309	21.11
02 SLP10D	105887	12.09	178341	14.49	102820	21.10
03 SLP10MS	108100	12.08	182933	14.48	93004	21.10
04 W40	120274	12.08	218471	14.48	92879	21.10
05						
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22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
 AREA LOWER LIMIT = - 50% of internal standard area  
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

8B  
SEMICVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Lab File ID (Standard): A285

Date Analyzed: 07/16/96

Instrument ID: A

Time Analyzed: 0832

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	87359	12.07	144408	14.47	76774	21.08
UPPER LIMIT	174718	12.57	288816	14.97	153548	21.58
LOWER LIMIT	43680	11.57	72204	13.97	38387	20.58
EPA SAMPLE NO.						
01 SLP10MSD	102565	12.06	160151	14.46	96278	21.07
02 W70	98316	12.06	163697	14.46	85854	21.08
03						
04						
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22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
 AREA LOWER LIMIT = - 50% of internal standard area  
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	SBLK01	74	86	66						0
02	LCS	75	94	77						0
03	SLP10FB	62	81	62						0
04	SLP10FBD	70	85	68						0
05	W29	66	44	68						0
06	SLP10	OD	OD	OD						0
07	SLP10D	OD	OD	OD						0
08	SLP10MS	OD	OD	OD						0
09	W40	OD	OD	OD						0
10	SLP10MSD	OD	OD	OD						0
11	W70	OD	OD	OD						0
12										
13										
14										
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S1 = Naphthalene-d8  
S2 = Chrysene-d12  
S3 = Fluorene-d10

QC LIMITS

(21-108)

(10-118)

(41-162)

# Column to be used to flag recovery values  
\* Values outside of contract required QC limits  
D Surrogate diluted out

## WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Matrix Spike - EPA Sample No.: SLP10

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	12	20	84	20-150
Naphthalene	9.5	0.00	11	116	20-150
Quinoline	9.5	0.00	14	147	20-150
2-Methylnaphthalene	9.5	0.00	8.7	92	20-150
Fluorene	9.5	230	260	316*	69-118
Chrysene	9.5	0.00	0.00	0*	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMITS RPD	REC.
1H-Indene	9.5	18	63	28*	20	20-150
Naphthalene	9.5	11	116	0	20	20-150
Quinoline	9.5	15	158*	7	20	20-150
2-Methylnaphthalene	9.5	8.7	92	0	20	20-150
Fluorene	9.5	240	105	100*	20	69-118
Chrysene	9.5	0.00	0*		20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 2 out of 7 outside limits

Spike Recovery: 6 out of 14 outside limits

COMMENTS: \_\_\_\_\_

FORM 3  
WATER SEMIVOLATILE METHOD SPIKE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Matrix Spike - Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
1H-Indene	10	7.0	70	20-150
Naphthalene	10	9.1	91	20-150
Quinoline	10	7.0	70	20-150
2-Methylnaphthalene	10	8.6	86	20-150
Fluorene	10	8.5	85	69-118
Chrysene	10	7.0	70	20-132
Benzo(e)pyrene	10	10	100	20-150

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

COMMENTS: \_\_\_\_\_

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Lab File ID: A262

Lab Sample ID: SBLK01

Instrument ID: A

Date Extracted: 06/11/96

Matrix: (soil/water) WATER

Date Analyzed: 07/12/96

Level: (low/med) LOW

Time Analyzed: 1308

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	LCS	49501-LCS	A263	07/12/96
02	SLP10FB	49501-02FB	A0501268	07/12/96
03	SLP10FBD	49501-02FD	A0601269	07/12/96
04	W29	49501-03	A0701270	07/12/96
05	SLP10	49501-01	A0101277	07/15/96
06	SLP10D	49501-01DU	A0201278	07/15/96
07	SLP10MS	49501-01MS	A0301279	07/15/96
08	W40	49501-04	A0501281	07/15/96
09	SLP10MSD	49501-01MSD	A1101296	07/16/96
10	W70	49501-05	A1301298	07/16/96
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1 of 1

FORM IV SV

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8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Lab File ID (Standard): A261

Date Analyzed: 07/12/96

Instrument ID: A

Time Analyzed: 1207

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	107057	12.13	172395	14.53	118397	21.14
UPPER LIMIT	214114	12.63	344790	15.03	236794	21.64
LOWER LIMIT	53528	11.63	86198	14.03	59198	20.64
EPA SAMPLE NO.						
01 SBLK01	111738	12.14	204215	14.54	180937	21.15
02 49501-LCS	120659	12.13	215656	14.54	149305	21.15
03 SLP10FB	126977	12.13	228820	14.53	142183	21.14
04 SLP10FBD	121479	12.13	217286	14.53	153157	21.14
05 W29	121567	12.13	215586	14.53	159936	21.14
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IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Case Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Lab File ID (Standard): A276

Date Analyzed: 07/15/96

Instrument ID: A

Time Analyzed: 1223

	IS1(ANT) AREA #	RT #	IS2(PEN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	86778	12.09	142267	14.49	119123	21.11
UPPER LIMIT	173556	12.59	284534	14.99	238216	21.61
LOWER LIMIT	43389	11.59	71134	13.99	59562	20.61
EPA SAMPLE NO.						
01 SLP10	99150	12.09	174251	14.49	121309	21.11
02 SLP10D	105887	12.09	178341	14.49	102820	21.10
03 SLP10MS	108100	12.08	182933	14.48	93004	21.10
04 W40	120274	12.08	218471	14.48	92879	21.10
05						
06						
07						
08						
09						
10						
11						
12						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PEN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
 AREA LOWER LIMIT = - 50% of internal standard area  
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

### Contract:

Case No.: 49501 SAS No.: SDG No.: 49501

**Date Analyzed:** 07/16/96

Instrument ID: A Time Analyzed: 0832

IS1 (ANT) = Acenaphthene-d<sub>10</sub>  
IS2 (PHN) = Phenanthrene-d<sub>10</sub>  
IS3 = Benzo(a)pyrene-d<sub>12</sub>

AREA UPPER LIMIT = +100% of internal standard area  
AREA LOWER LIMIT = - 50% of internal standard area  
RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

\* Column used to flag internal standard area values with an asterisk.  
+ Values outside of QC limits.

of 1

**FORM VIII SV-1**

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1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

W402

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 49403 SAS No.: SDG No.: 49403

Matrix: (soil/water) WATER Lab Sample ID: 49403-03

Sample wt/vol: 4150 (g/ml) ML Lab File ID: A0701292

Level: (low/med) LOW Date Received: 06/05/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/07/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/16/96

Injection Volume: 1.0 (uL) Dilution Factor: 2.0

PCP Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	9.8 U
496-11-7-----	2,3-Dihydroindene	26
95-13-6-----	1H-Indene	28
91-20-3-----	Naphthalene	36
95-15-8-----	Benzo(b)thiophene	230
91-22-5-----	Quinoline	13
120-72-9-----	1H-Indole	4.8 U
91-57-6-----	2-Methylnaphthalene	13
90-12-0-----	1-Methylnaphthalene	13
92-52-4-----	Biphenyl	8.3 U
208-96-8-----	Acenaphthylene	2.7 U
83-32-9-----	Acenaphthene	7.3
132-64-9-----	Dibenzofuran	4.3
86-73-7-----	Fluorene	5.6
132-65-0-----	Dibenzothiophene	2.1 U
85-01-8-----	Phenanthrene	6.6
120-12-7-----	Anthracene	2.1 U
260-94-6-----	Acridine	5.6 U
86-74-8-----	Carbazole	3.7 U
206-44-0-----	Fluoranthene	3.0
129-00-0-----	Pyrene	10
56-55-3-----	Benzo(a)Anthracene	4.8 U
218-01-9-----	Chrysene	5.4 U
207-08-9-----	Benzo(b)fluoranthene	4.8 U
205-08-9-----	Benzo(k)fluoranthene	4.4 U
192-97-2-----	Benzo(e)pyrene	3.7 U
50-32-8-----	Benzo(a)pyrene	4.4 U
198-55-0-----	Perylene	4.8 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	4.0 U
53-70-3-----	Dibenzo(a,h)anthracene	3.1 U
191-24-2-----	Benzo(g,h,i)perylene	5.4 U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

W403

ab Code: Case No.: 49403 SAS No.: SDG No.: 49403

atrix: (soil/water) WATER Lab Sample ID: 49403-04

ample wt/vol: 4200 (g/ml) ML Lab File ID: A0301288

evel: (low/med) LOW Date Received: 06/05/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/07/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/16/96

njection Volume: 1.0 (uL) Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	52	_____
95-13-6-----	1H-Indene	19	_____
91-20-3-----	Naphthalene	16	_____
95-15-8-----	Benzo(b)thiophene	20	_____
91-22-5-----	Quinoline	3.4	_____
120-72-9-----	1H-Indole	10	_____
91-57-6-----	2-Methylnaphthalene	6.9	_____
90-12-0-----	1-Methylnaphthalene	16	_____
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	12	_____
132-64-9-----	Dibenzofuran	6.3	_____
86-73-7-----	Fluorene	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	7.6	_____
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	3.0	_____
129-00-0-----	Pyrene	13	_____
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	4.2	_____

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

> Name: QUANTERRA DENVER

Contract:

W406

> Code: Case No.: 49403 SAS No.: SDG No.: 49403

Matrix: (soil/water) WATER Lab Sample ID: 49403-05

Sample wt/vol: 4150 (g/ml) ML Lab File ID: A0201287

Level: (low/med) LOW Date Received: 06/05/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/07/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/16/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

C Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND	UNITS	
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.87	U
91-20-3-----	Naphthalene	6.3	U
95-15-8-----	Benz(b)thiophene	0.87	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.0	U
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	0.96	U
86-73-7-----	Fluorene	0.96	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	2.4	U
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	15	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303 421-6611 Telephone  
303 431-7171 Fax

**CASE NARRATIVE**

**FOR**

**City of St. Louis Park**

**July 19, 1996**

**Quanterra Environmental Services**

**Project Number 049534**

**Introduction**

Ten aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on June 12, 1996. The samples were logged in under Quanterra Denver's project number 049534. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

**Data Quality Assessment**

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

**Reported By:**

  
Kurt C. III

**Date:**

7/19/96

Kurt C. III  
Program Manager

**Reviewed By:**

  
Mr. D. Ruwe

**Date:**

7/22/96

**QUALIFIER CODES AND THEIR USAGE**

- A = This flag indicates that a TIC is a suspected aldol-condensation product.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.
- C = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, the the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L:
- J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

**QUALIFIER CODES AND THEIR USAGE**  
**Page Two**

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

S = The concentration of this compound saturated the capacity of the detector and a valid quantitation could not be obtained at this dilution.

U = Indicates compound was analyzed for, but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.

X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".

R = Target compound's secondary ion confirmation not met, however peak shape and retention time make peak identification positive.

ANALYTICAL TEST REQUESTS  
for  
City of St. Louis Park

Lab ID: 049534	Group Code	Analysis Description	Custom Test?
0001 - 0008	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N
0002	B	Prep - PAH/SIM by GC/MS Low Level Polynuclear Aromatic Hydrocarbons, SIM Low Level	N

**SAMPLE DESCRIPTION INFORMATION**  
 for  
**City of St. Louis Park**

Lab ID	Client ID	Matrix	Sampled Date	Received Time	Received Date
049534-0001-SA	PCJ-SLP14-061196	AQUEOUS	11 JUN 96		12 JUN 96
049534-0001-DU	PCJ-SLP14D-061196	AQUEOUS	11 JUN 96		12 JUN 96
049534-0002-FB	PCJ-SLP14FB-061196	AQUEOUS	11 JUN 96		12 JUN 96
049534-0002-FD	PCJ-SLP14FBD-061196	AQUEOUS	11 JUN 96		12 JUN 96
049534-0003-SA	PCJ-E2-061196	AQUEOUS	11 JUN 96	09:35	12 JUN 96
049534-0004-SA	PCJ-E3-061196	AQUEOUS	11 JUN 96	09:50	12 JUN 96
049534-0005-SA	PCJ-E7-061196	AQUEOUS	11 JUN 96	10:40	12 JUN 96
049534-0006-SA	PCJ-E13-061196	AQUEOUS	11 JUN 96	10:25	12 JUN 96
049534-0007-SA	PCJ-E15-061196	AQUEOUS	11 JUN 96	10:10	12 JUN 96
049534-0008-SA	PCJ-W401-061196	AQUEOUS	11 JUN 96	05:40	12 JUN 96





**Chain of Custody  
Record**

**Environmental  
Services**

QUA-4124-1

Client

City of St Louis Park

Project Manager

Bill Gross

Date

6/14/96

Chain Of Custody Number

66201

Address

Telephone Number (Area Code)/Fax Number

612-924-0193

Lab Number

Page

1 of 1

City

St Louis Park

State

Mn

Zip Code

55410

Site Contact

Scott Anderson

Lab Contact

Carrier/Waybill Number

Analysis (Attach list if  
more space is needed)

Project Name

Contract/Purchase Order/Quote No.

Matrix

Containers &  
Preservatives

Special Instructions/  
Conditions of Receipt

**Sample I.D. No. and Description**

(Containers for each sample may be combined on one line)

PCJ-E2-061196

Date

Time

Aqueous

Sed.

Soil

Impres-

Person

PCP

MNCS

HCl

NaOH

ZnAC

NaOH

PCJ-E3-061196

6/14/96

9:35

X

X

X

X

X

X

X

X

X

X

PPT-5 -03

PPT-5 -04

Possible Hazard Identification

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Sample Disposal

Return To Client

Disposal By Lab

Archive For

(A fee may be assessed if samples are retained  
months longer than 3 months)

Turn Around Time Required

24 Hours  48 Hours  Days  14 Days  21 Days

Other

Standard

Date

Time

QC Requirements (Specify)

1. Relinquished By

Kestell

Date

Time

Date

Time

2. Relinquished By

Date

Time

Date

Time

3. Relinquished By

Date

Time

Received By

J. McChart

Date

Time

Comments

DOCTRILL

I: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy



**Chain of Custody  
Record**

QJA-J124-1

Client

Citrop St Louis Park

Address

Project Manager

Bill Gross

Telephone Number (Area Code)/Fax Number

(612) 924-0112

Date

6/11/96

Chain Of Custody Number

66203

Lab Number

Page

1 of 1

City

St Louis Park

State

W 55416

Project Name

SLP

Site Contact

Scott Anderson

Lab Contact

Analysis (Attach list if  
more space is needed)

Contract/Purchase Order/Quote No.

Special Instructions/  
Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Aqueous	Sed.	Soil	Containers & Preservatives						
						Units	H2SO4	HNO3	HCl	NaOH	ZnAc	NaOH
PCJ-E15-061196	6/11/96	10:10 AM	X			6						
PCJ-W401-061196	6/11/96	5:40 AM	X			6						

Possible Hazard Identification

Non-Hazard

Flammable

Skin Irritant

Poison B

Unknown

Sample Disposal

Return To Client

Disposal By Lab

Archive For

(A fee may be assessed if samples are retained  
Months longer than 3 months)

Turn Around Time Required

24 Hours

48 Hours

7 Days

14 Days

21 Days

Other Standard

QC Requirements (Specify)

1. Relinquished By

Kel Klar

Date

6/11/96

Time

1. Received By

J DeCham

Date

6/11/96

Time

2. Relinquished By

Date

Time

2. Received By

Date

Time

3. Relinquished By

Date

Time

3. Received By

Date

Time

Comments

DISTRIBUTIVE

WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP14

Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 49534 SAS No.: SDG No.: 49534

Matrix: (soil/water) WATER Lab Sample ID: 49534-01

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0201315

Level: (low/med) LOW Date Received: 06/12/96

\* Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/13/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/17/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.8 U
496-11-7-----	2,3-Dihydroindene	16 _____
95-13-6-----	1H-Indene	1.4 _____
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	1.5 _____
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	2.4 _____
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	9.3 _____
83-32-9-----	Acenaphthene	17 _____
132-64-9-----	Dibenzofuran	0.95 U
86-73-7-----	Fluorene	0.95 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	2.3 _____
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.6 _____
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP14D

b Name: QUANTERRA DENVER Contract:

b Code: Case No.: 49534 SAS No.: SDG No.: 49534

Matrix: (soil/water) WATER Lab Sample ID: 49534-01DU

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0301316

Level: (low/med) LOW Date Received: 06/12/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/13/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/17/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

HPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U	
496-11-7-----	2,3-Dihydroindene	13		
95-13-6-----	1H-Indene	1.3		
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	1.4		
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	2.1		
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	7.7		
83-32-9-----	Acenaphthene	15		
132-64-9-----	Dibenzofuran	0.95	U	
86-73-7-----	Fluorene	0.95	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	1.8		
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)Fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP14FB

Name: QUANTERRA DENVER Contract:

Code: Case No.: 49534 SAS No.: SDG No.: 49534

Matrix: (soil/water) WATER Lab Sample ID: 49534-02FB

Sample wt/vol: 4180 (g/ml) ML Lab File ID: A0401317

Level: (low/med) LOW Date Received: 06/12/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/13/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/17/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	1.5 U
95-13-6-----	1H-Indene	0.86 U
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	3.0 U
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	0.96 U
86-73-7-----	Fluorene	0.96 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	1.7 U
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)Fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(a,h,i)perylene	2.7 U

1B  
SEMI VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP14FBD

Lab Name: QUANTERRA DENVER Contract:

Lab Code: Case No.: 49534 SAS No.: SDG No.: 49534

Matrix: (soil/water) WATER Lab Sample ID: 49534-02FD

Sample wt/vol: 4170 (g/ml) ML Lab File ID: A0501318

Level: (low/med) LOW Date Received: 06/12/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/13/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/17/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U	
496-11-7-----	2,3-Dihydroindene	1.6		
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	2.7		
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.96	U	
86-73-7-----	Fluorene	0.96	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	1.6		
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE N .

Name: QUANTERRA DENVER Contract: DCS1

Code: Case No.: 49534 SAS No.: SDG No.: 49534

Matrix: (soil/water) WATER Lab Sample ID: 49534-DCS1

Sample wt/vol: 4000 (g/ml) ML Lab File ID: A0901294

Rel: (low/med) LOW Date Received: \_\_\_\_\_

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/13/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/16/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

C Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	
95-13-6-----	1H-Indene_____	7.2	
91-20-3-----	Naphthalene_____	9.4	
91-22-5-----	Quinoline_____	8.5	
91-57-6-----	2-Methylnaphthalene_____	8.0	
86-73-7-----	Fluorene_____	7.7	
218-01-9-----	Chrysene_____	6.9	
192-97-2-----	Benzo(e)pyrene_____	8.8	

<sup>1B</sup>  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DCS2

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 49534 SAS No.: SDG No.: 49534

Fix: (soil/water) WATER Lab Sample ID: 49534-DCS2

ple wt/vol: 4000 (g/ml) ML Lab File ID: A1001295

al: (low/med) LOW Date Received: \_\_\_\_\_

oisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/13/96

centrated Extract Volume: 0.5 (ml) Date Analyzed: 07/16/96

ection Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L Q

95-13-6-----	1H-Indene	7.4	
91-20-3-----	Naphthalene	10	
91-22-5-----	Quinoline	9.4	
91-57-6-----	2-Methylnaphthalene	8.7	
86-73-7-----	Fluorene	8.3	
218-01-9-----	Chrysene	6.6	
192-97-2-----	Benzo(e)pyrene	8.3	

<sup>2C</sup>  
WATER SEMIVOLATILE SURROGATE RECOVERY

Name: QUANTERRA DENVER

Contract:

o Code:

Case No.: 49534

SAS No.:

SDG No.: 49534

EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01 SBLK01	76	101	68						0
02 DCS1	79	91	67						0
03 DCS2	76	87	79						0
04 SLP14	79	55	78						0
05 SLP14D	72	49	67						0
06 SLP14FB	78	102	73						0
07 SLP14FBD	76	108	68						0
08 E2	74	50	73						0
09 E3	73	55	63						0
10 E7	74	48	72						0
11 E13	73	57	70						0
12 E15	68	39	61						0
13 W401	68	51	70						0
14									
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30									

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

a Name: QUANTERRA DENVER	Contract:		
b Code:	Case No.: 49534	SAS No.:	SDG No.: 49534
b File ID: A0801293	Lab Sample ID: SBLK01		
Instrument ID: A	Date Extracted: 06/13/96		
Matrix: (soil/water) WATER	Date Analyzed: 07/16/96		
Level: (low/med) LOW	Time Analyzed: 1341		

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 DCS1	49534-DCS1	A0901294	07/16/96
02 DCS2	49534-DCS2	A1001295	07/16/96
03 SLP14	49534-01	A0201315	07/17/96
04 SLP14D	49534-01DU	A0301316	07/17/96
05 SLP14FB	49534-02FB	A0401317	07/17/96
06 SLP14FBD	49534-02FD	A0501318	07/17/96
07 E2	49534-03	A0601319	07/17/96
08 E3	49534-04	A0701320	07/17/96
09 E7	49534-05	A0801321	07/17/96
10 E13	49534-06	A0901322	07/17/96
11 E15	49534-07	A1001323	07/17/96
12 W401	49534-08	A1101324	07/17/96
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COMMENTS:

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1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA

SBLK01

By: QUANTERRA DENVER Contract: \_\_\_\_\_

Re: Case No.: 49534 SAS No.: SDG No.: 49534

: (soil/water) WATER Lab Sample ID: SBLK01

: wt/vol: 4000 (g/ml) ML Lab File ID: A0801293

: (low/med) LOW Date Received: \_\_\_\_\_

Storage: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/13/96

Extracted Extract Volume: 0.5 (ml) Date Analyzed: 07/16/96

Reaction Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	NG/L
271-89-6-----	2,3-Benzofuran	5.1	U
496-11-7-----	2,3-Dihydroindene	1.4	U
95-13-6-----	1H-Indene	0.90	U
91-20-3-----	Naphthalene	6.5	U
95-15-8-----	Benzo(b)thiophene	0.90	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.5	U
91-57-6-----	2-Methylnaphthalene	0.90	U
90-12-0-----	1-Methylnaphthalene	1.6	U
92-52-4-----	Biphenyl	4.3	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	1.0	U
86-73-7-----	Fluorene	1.0	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	1.3	U
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.9	U
86-74-8-----	Carbazole	1.9	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.5	U
218-01-9-----	Chrysene	2.8	U
207-08-9-----	Benzo(b)fluoranthene	2.5	U
205-08-9-----	Benzo(k)fluoranthene	2.3	U
192-97-2-----	Benzo(e)pyrene	1.9	U
50-32-8-----	Benzo(a)pyrene	2.3	U
198-55-0-----	Perylene	2.5	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.8	U

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

3 Name: QUANTERRA DENVER

### **Contract:**

**Case No.: 49534**

**SAS No.:**

**SDG No.: 49534**

b File ID (Standard): A285

Date Analyzed: 07/16/96

:strument ID: A

Time Analyzed: 0832

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	87359	12.07	144408	14.47	76774	21.08
UPPER LIMIT	174718	12.57	288816	14.97	153548	21.58
LOWER LIMIT	43680	11.57	72204	13.97	38387	20.58
EPA SAMPLE NO.						
J1 SBLK01	100759	12.06	164095	14.46	122914	21.08
J2 DCS1	97706	12.06	156710	14.46	110971	21.07
J3 DCS2	99857	12.06	181097	14.46	150082	21.07
J4						
J5						
J6						
J7						
J8						
J9						
J10						
J11						
J12						
J13						
J14						
J15						
J16						
J17						
J18						
J19						
J20						
J21						
J22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
AREA LOWER LIMIT = - 50% of internal standard area  
RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

8B  
SEMICVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

b Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 49534

SAS No.:

SDG No.: 49534

ab File ID (Standard): A313

Date Analyzed: 07/17/96

nstrument ID: A

Time Analyzed: 0849

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	85178	12.01	145040	14.40	72119	21.01
UPPER LIMIT	170356	12.51	290080	14.90	144238	21.51
LOWER LIMIT	42589	11.51	72520	13.90	36060	20.51
EPA SAMPLE NO.						
01 SLP14	94635	12.00	163304	14.39	101113	21.01
02 SLP14D	93541	12.00	155159	14.39	75972	21.00
03 SLP14FB	88576	11.99	147531	14.39	61865	21.01
04 SLP14FBD	95056	12.00	142746	14.39	56390	21.01
05 E2	102033	11.99	170861	14.39	104625	21.00
06 E3	88737	11.99	151344	14.39	70844	21.00
07 E7	95480	11.99	168564	14.39	89390	21.00
08 E13	98407	12.00	179064	14.39	85341	21.01
09 E15	95904	11.99	155872	14.39	91102	21.00
10 W401	95734	11.99	162050	14.39	85061	21.01
11						
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22						

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

<sup>2C</sup>  
WATER SEMIVOLATILE SURROGATE RECOVERY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 49534 SAS No.:

SDG No.: 49534

EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
1 SBLK01	76	101	68						0
2 DCS1	79	91	67						0
3 DCS2	79	87	79						0
4 SLP14	79	55	78						0
5 SLP14D	72	49	67						0
6 SLP14FB	78	102	73						0
7 SLP14FBD	76	108	68						0
8 E2	74	50	73						0
9 E3	73	55	63						0
10 E7	74	48	72						0
11 E13	73	57	70						0
12 E15	68	39	61						0
13 W401	68	51	70						0
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QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

4B  
SEMICVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01
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by QUANTERRA DENVER

Contract:

Case No.: 49534	SAS No.:	SDG No.: 49534
File ID: A0801293	Lab Sample ID: SBLK01	
Instrument ID: A	Date Extracted: 06/13/96	
Type: (soil/water) WATER	Date Analyzed: 07/16/96	
Conc.: (low/med) LOW	Time Analyzed: 1341	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 DCS1	49534-DCS1	A0901294	07/16/96
02 DCS2	49534-DCS2	A1001295	07/16/96
03 SLP14	49534-01	A0201315	07/17/96
04 SLP14D	49534-01DU	A0301316	07/17/96
05 SLP14FB	49534-02FB	A0401317	07/17/96
06 SLP14FBD	49534-02FD	A0501318	07/17/96
07 E2	49534-03	A0601319	07/17/96
08 E3	49534-04	A0701320	07/17/96
09 E7	49534-05	A0801321	07/17/96
10 E13	49534-06	A0901322	07/17/96
11 E15	49534-07	A1001323	07/17/96
12 W401	49534-08	A1101324	07/17/96
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of 1

FORM IV SV

3/90

**8B**  
**SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY**

Name: QUANTERRA DENVER

**Contract:**

Code: Case No.: 49534

**SAS No.:** SDG No.: 49534

File ID (Standard) : A285

Date Analyzed: 07/16/96

Document ID: A

Time Analyzed: 0832

**IS1 (ANT)** = Acenaphthene-d10  
**IS2 (PHN)** = Phenanthrene-d10  
**IS3** = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
AREA LOWER LIMIT = - 50% of internal standard area  
RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

**Contract:**

Case No.: 49534

SAS No.: SDG No.: 49534

File ID (Standard) : A313

Date Analyzed: 07/17/96

Document ID: A

Time Analyzed: 0849

**IS1** (ANT) = Acenaphthene-d10  
**IS2** (PHN) = Phenanthrene-d10  
**IS3** = Benzo(a)pyrane-d12

AREA UPPER LIMIT = +100% of internal standard area  
AREA LOWER LIMIT = - 50% of internal standard area  
RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303 421-6611 Telephone  
303 431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

July 27, 1996

Quanterra Environmental Services

Project Number 049697

### Introduction

Nine aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on June 18, 1996. The samples were logged in under Quanterra Denver's project number 049697. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

### Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

Client sample with lab Id 049697-005 had to be diluted due to ion ratios being out of acceptance ranges. The sample was diluted 5X with the same results. The diluted sample results are reported and are identified as -005DL. The LCS and blank associated with this sample are within the acceptance criteria stated in the QAPP. A matrix effect is indicated. As a result of the dilution the surrogates were not detected and are reported with a "D".

The spike compound benzo (e) pyrene in the matrix spike and matrix spike duplicate sample are reported at 0% recovery. The LCS and blank associated with these samples are within acceptance criteria stated in the QAPP. A matrix effect is indicated. Data is considered acceptable.

The spike compound chrysene in the matrix spike duplicate sample is reported at 0% recovery. The LCS and blank associated with this sample is within acceptance criteria stated in the QAPP. A matrix effect is indicated. Data is considered acceptable.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By: Kurt C. III Date: July 27, 1996  
Kurt C. III  
Program Manager

Reviewed By: J. M. Hayes Date: 7/27/96

QUALIFIER CODES AND THEIR USAGE

- = This flag indicates that a TIC is a suspected aldol-condensation product.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.
- C = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, the the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L:
- J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

**QUALIFIER CODES AND THEIR USAGE**  
**Page Two**

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

S = The concentration of this compound saturated the capacity of the detector and a valid quantitation could not be obtained at this dilution.

U = Indicates compound was analyzed for, but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.

X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".

R = Target compound's secondary ion confirmation not met, however peak shape and retention time make peak identification positive.

**ANALYTICAL TEST REQUESTS  
for  
City of St. Louis Park**

Lab ID: 049697	Group Code	Analysis Description	Custom Test?
0001 - 0005	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N
0002	B	Prep - PAH/SIM by GC/MS Low Level Polynuclear Aromatic Hydrocarbons, SIM Low Level	N

**SAMPLE DESCRIPTION INFORMATION**  
 for  
**City of St. Louis Park**

Lab ID	Client ID	Matrix	Sampled Date	Received Time	Received Date
049697-0001-SA	PCJ-SLP16-061796	AQUEOUS	17 JUN 96		18 JUN 96
049697-0001-DU	PCJ-SLP16D-061796	AQUEOUS	17 JUN 96		18 JUN 96
049697-0001-MS	PCJ-SLP16MS-061796	AQUEOUS	17 JUN 96		18 JUN 96
049697-0001-SD	PCJ-SLP16MSD-061796	AQUEOUS	17 JUN 96		18 JUN 96
049697-0002-FB	PCJ-SLP16FB-061796	AQUEOUS	17 JUN 96		18 JUN 96
049697-0002-FD	PCJ-SLP16FBD-061796	AQUEOUS	17 JUN 96		18 JUN 96
049697-0003-SA	PCJ-H6-061796	AQUEOUS	17 JUN 96	10:00	18 JUN 96
049697-0004-SA	PCJ-MTK6-061796	AQUEOUS	17 JUN 96	10:45	18 JUN 96
049697-0005-SA	PCJ-W48-061796	AQUEOUS	17 JUN 96	13:10	18 JUN 96

## Record

Enviro  
Services

QUA-4124-1

Client

City of St. Louis Park  
3752 Wooddale Ave So  
St. Louis Park MN 55416

## Project Manager

Scott Anderson

Telephone Number (Area Code)/Fax Number

(612) 924-2557

(612) 924-2570

## Date

6-17-96

## Chain Of Custody Number

75662

Address

City

## Project Name

SAME

Contract/Purchase Order/Quote No.

## Site Contact

## Lab Contact

Lab Number

Page 1 of 84

## Carrier/Waybill Number

FED EX 7828345626

## Analysis (Attach list if more space is needed)

Special Instructions/  
Conditions of ReceiptSample I.D. No. and Description  
(Containers for each sample may be combined on one line)

## Date

## Time

Aquous	Sed.	Soln	Unspec	H2SO4	HNO3	HCl	NaOH	ZnAc2	NaOH	PPT PPH	PPT PPH
X										X	X
X										XX	XX

-01

-01 PM

## Possible Hazard Identification

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

## Sample Disposal

 Return To Client Disposal By Lab Archive For(A fee may be assessed if samples are retained  
Months longer than 3 months)

## Turn Around Time Required

24 Hours  48 Hours  7 Days  14 Days  21 Days  Other \_\_\_\_\_

## 1. Relinquished By

JZB

Date 6-17-96 Time 2:30

## 2. Relinquished By

Date 6-17-96 Time

## 3. Relinquished By

Date Time

## 1. Received By

JDech

Date 6/18/96 Time 900

## 2. Received By

## 3. Received By

## Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

## Record

Environmental  
Services

QUA-4124-1

Client

Address

City

Project Name

SAWIE

Contract/Purchase Order/Quote No.

Project Manager

SCOTT ANDERSON

Telephone Number (Area Code)/Fax Number

(612) 924-2557 924-2570

Date

6-17-96

Lab Number

Chain Of Custody Number

75663

Page 1 of 24

Site Contact

Lab Contact

Analysis (Attach list if  
more space is needed)

Carrier/Waybill Number

FED EX 7828345626

Matrix

Containers &  
Preservatives

Aqueous

Sed.

Soil

Untested

H2SO4

HNO3

HCl

NaOH

ZnAc2

NaClO4

HNO3

PPT

HCl

PPT

NaOH

ZnAc2

NaClO4

Sample I.D. No. and Description  
(Containers for each sample may be combined on one line)

PCJ-5LP16MS -061796

Date

PCJ-5LP16MSD -061796

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6-17-96

## Record

Environmental  
Services

QIA-4124-1

Client

City of St. Louis Park  
3752 Wooddale Ave So  
St. Louis Park MN 55416

Project Manager

SCOTT ANDERSON

Telephone Number (Area Code)/Fax Number

(612) 924-2557 924-2570

Date

6-17-96

Lab Number

66397

Address

City

Project Name

SAME

Contract/Purchase Order/Quote No

Site Contact

Lab Contact

Analysis (Attach list if  
more space is needed)

Page 1 of 4

Special Instructions/  
Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix			Containers & Preservatives													
			Solid	Liquid	Gel	UN3081	Hazardous	PCP											
PCJ-5LP16FB-061796	6-17-96		X																
PCJ-5LP16FDD-061796	6-17-96		X																

## Possible Hazard Identification

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months (A fee may be assessed if samples are retained longer than 3 months)

## Turn Around Time Required

24 Hours  48 Hours  7 Days  14 Days  21 Days  Other \_\_\_\_\_

## 1. Relinquished By

M2R

Date

6-17-96

Time

2:30

1. Received By

JDeLL

Date

6/18/96

Time

900

## 2. Relinquished By

Date

2. Received By

Date

## 3. Relinquished By

Date

3. Received By

Date

## Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy



1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Name: QUANTERRA DENVER	Contract:	SLP16	
de:	Case No.: 49697	SAS No.:	SDG No.: 49697
atrix: (soil/water) WATER	Lab Sample ID: 49697-01		
ample wt/vol: 4200 (g/ml) ML	Lab File ID: A0301342		
evel: (low/med) LOW	Date Received: 06/18/96		
Moisture: _____ decanted: (Y/N) _____	Date Extracted: 06/18/96		
concentrated Extract Volume: 0.5 (ml)	Date Analyzed: 07/19/96		
jection Volume: 1.0 (uL)	Dilution Factor: 1.0		
PC Cleanup: (Y/N) N	pH: 7.0		

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND		Q
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	1.9	_____
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.0	B
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	2.2	_____
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorene	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.7	B
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP16D

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

Matrix: (soil/water) WATER

Lab Sample ID: 49697-01DU

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: A0401343

Level: (low/med) LOW

Date Received: 06/18/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/18/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/19/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U	
496-11-7-----	2,3-Dihydroindene	1.6		
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	1.9	B	
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	2.1		
132-64-9-----	Dibenzofuran	0.95	U	
86-73-7-----	Fluorene	0.95	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	1.7	B	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)Fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP16FBD

Lab Name: QUANTERRA DENVER Contract: \_\_\_\_\_  
 Case No.: 49697 SAS No.: \_\_\_\_\_ SDG No.: 49697  
 Matrix: (soil/water) WATER Lab Sample ID: 49697-02FD  
 Sample wt/vol: 4170 (g/ml) ML Lab File ID: A1601329  
 Level: (low/med) LOW Date Received: 06/18/96  
 Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/18/96  
 Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/17/96  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 PC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U	
496-11-7-----	2,3-Dihydroindene	1.3	U	
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	2.2	B	
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.96	U	
86-73-7-----	Fluorene	0.96	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	2.0	B	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP16FB

Lab Name: QUANTERRA DENVER Contract:

Lab Sample ID: 49697-02FB

Case No.: 49697 SAS No.: SDG No.: 49697

Matrix: (soil/water) WATER Lab File ID: A1501328

Sample wt/vol: 4175 (g/ml) ML Date Received: 06/18/96

Level: (low/med) LOW Date Extracted: 06/18/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Analyzed: 07/17/96

Concentrated Extract Volume: 0.5 (ml) Dilution Factor: 1.0

Injection Volume: 1.0 (uL)

C Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	1.3 U
95-13-6-----	1H-Indene	0.86 U
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	2.9 B
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	0.96 U
86-73-7-----	Fluorene	0.96 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	2.4 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

.ab Name: QUANTERRA DENVER

Contract:

-b Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	SBLK01	79	98	74						0
02	LCS	80	104	66						0
03	SLP16FB	77	105	73						0
04	SLP16FBD	76	104	64						0
05	H6	69	46	68						0
06	MTK6	73	44	67						0
07	W48	65	39	100						0
08	SLP15	80	62	77						0
09	SLP15D	74	43	75						0
10	SLP16MS	71	51	73						0
11	SLP16MSD	70	48	68						0
12	W48DL	OD	OD	OD						0
13										
14										
15										
16										
17										
18										
19										
20										
21										
24										
25										
26										
27										
28										
29										
30										

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

## WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

Matrix Spike - EPA Sample No.: SLP16

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	0.00	5.8	61	20-150
Naphthalene	9.5	0.00	9.5	100	20-150
Quinoline	9.5	0.00	8.5	89	20-150
2-Methylnaphthalene	9.5	2.0	8.7	70	20-150
Fluorene	9.5	0.00	7.6	80	69-118
Chrysene	9.5	0.00	3.0	32	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	MSD % RPD #	QC LIMITS RPD	QC LIMITS REC.
1H-Indene	9.5	5.8	61	0	20	20-150
Naphthalene	9.5	8.9	94	6	20	20-150
Quinoline	9.5	8.0	84	6	20	20-150
2-Methylnaphthalene	9.5	8.3	66	6	20	20-150
Fluorene	9.5	7.4	78	2	20	69-118
Chrysene	9.5	0.00	0*		20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

Column to be used to flag recovery and RPD values with an asterisk  
 Values outside of QC limits

D: 0 out of 7 outside limits  
 like Recovery: 3 out of 14 outside limits

COMMENTS: \_\_\_\_\_

## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP16MS

Lab Name: QUANTERRA DENVER

Contract:

Lab No.: Case No.: 49697 SAS No.: SDG No.: 49697

Matrix: (soil/water) WATER Lab Sample ID: 49697-01MS

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0501344

Level: (low/med) LOW Date Received: 06/18/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/18/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/19/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND		
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	2.0	_____
95-13-6-----	1H-Indene	5.8	_____
91-20-3-----	Naphthalene	9.5	_____
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	8.5	_____
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	8.7	B
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	2.3	_____
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorene	7.6	_____
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.8	B
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	3.0	_____
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

SLP16MSD

Lab Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

Matrix: (soil/water) WATER

Lab Sample ID: 49697-01MSD

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: A0601345

Level: (low/med) LOW

Date Received: 06/18/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/18/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/19/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND		Q
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	1.7	_____
95-13-6-----	1H-Indene	5.8	_____
91-20-3-----	Naphthalene	8.9	_____
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	8.0	_____
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	8.3	B
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	2.0	_____
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorene	7.4	_____
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.8	B
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

FORM 3  
WATER SEMIVOLATILE METHOD SPIKE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

atrix Spike - Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
1H-Indene	10	7.0	70	20-150
Naphthalene	10	9.3	93	20-150
Quinoline	10	7.3	73	20-150
2-Methylnaphthalene	10	8.2	82	20-150
Fluorene	10	7.3	73	69-118
Chrysene	10	7.5	75	20-132
Benzo(e)pyrene	10	9.9	99	20-150

\* Column to be used to flag recovery and RPD values with an asterisk  
 : Values outside of QC limits

COMMENTS:

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**SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY**

.b Name: QUANTERRA DENVER

### **Contract:**

**b Code:** Case No.: 49697

**SAS No.:**

SDG No.: 49697

b File ID (Standard): A313

Date Analyzed: 07/17/96

:strument ID: A

Time Analyzed: 0849

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
AREA LOWER LIMIT = - 50% of internal standard area  
RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Case Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

Lab File ID (Standard): A339

Date Analyzed: 07/19/96

Instrument ID: A

Time Analyzed: 0925

	IS1 (ANT) AREA #	RT #	IS2 (PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	92011	12.14	153973	14.54	97182	21.14
UPPER LIMIT	134022	12.64	307946	15.04	194364	21.64
LOWER LIMIT	46006	11.64	76986	14.04	48591	20.64
EPA SAMPLE NO.						
J1 MTK6	109232	12.14	175823	14.54	122146	21.14
J2 W48	153926	12.14	255597	14.53	169417	21.14
J3 SLP16	115237	12.14	209201	14.53	143005	21.14
J4 SLP16D	115069	12.13	212393	14.53	151986	21.14
J5 SLP16MS	121300	12.14	211069	14.53	138475	21.14
J6 SLP16MSD	118705	12.13	215253	14.54	147314	21.13
J7						
J8						
J9						
J0						
J1						
J2						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 49697 SAS No.: SDG No.: 49697

Lab File ID (Standard): A0101382

Date Analyzed: 07/26/96

Instrument ID: A

Time Analyzed: 1107

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	94436	12.10	100888	14.50	34261	21.10
UPPER LIMIT	188872	12.60	201776	15.00	68522	21.60
LOWER LIMIT	47218	11.60	50444	14.00	17130	20.60
EPA SAMPLE NO.						
01 W48DL	104945	12.10	140902	14.50	27743	21.10
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

**2C**  
**WATER SEMIVOLATILE SURROGATE RECOVERY**

Name : QUANTERRA DENVER

**Contract:**

Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

S1 = Naphthalene-d<sub>8</sub>  
 S2 = Chrysene-d<sub>12</sub>  
 S3 = Fluorene-d<sub>10</sub>

QC LIMITS  
(21-108)  
(10-118)  
(41-162)

# Column to be used to flag recovery values  
\* Values outside of contract required QC limits  
D Surrogate diluted out

3 1 of 1

**FORM II SV-1**

3 / 90

## LITER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

Matrix Spike - EPA Sample No.: SLP16

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1-H-Indene	9.5	0.00	5.8	61	20-150
Naphthalene	9.5	0.00	9.5	100	20-150
Quinoline	9.5	0.00	8.5	89	20-150
-Methylnaphthalene	9.5	2.0	8.7	70	20-150
Fluorene	9.5	0.00	7.6	80	69-118
Chrysene	9.5	0.00	3.0	32	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	MSD % RPD #	QC LIMTS RPD	LIMITS REC.
1-H-Indene	9.5	5.8	61	0	20	20-150
Naphthalene	9.5	8.9	94	6	20	20-150
Quinoline	9.5	8.0	84	6	20	20-150
-Methylnaphthalene	9.5	8.3	66	6	20	20-150
Fluorene	9.5	7.4	78	2	20	69-118
Chrysene	9.5	0.00	0*		20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

Column to be used to flag recovery and RPD values with an asterisk  
 Values outside of QC limits

0 out of 7 outside limits  
 Recovery: 3 out of 14 outside limits

RENTS:

FORM 3  
WATER SEMIVOLATILE METHOD SPIKE RECOVERY

Name: QUANTERRA DENVER

Contract:

ode:

Case No.: 49697

SAS No.:

SDG No.: 49697

six Spike - Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
H-Indene	10	7.0	70	20-150
aphthalene	10	9.3	93	20-150
linoline	10	7.3	73	20-150
-Methylnaphthalene	10	8.2	82	20-150
luorene	10	7.3	73	69-118
rysene	10	7.5	75	20-132
enzo(e)pyrene	10	9.9	99	20-150

Column to be used to flag recovery and RPD values with an asterisk  
Values outside of QC limits

MENTS:

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4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

b Name: QUANTERRA DENVER	Contract:	
b Code:	Case No.: 49697	SAS No.: SDG No.: 49697
b File ID: A1301326		Lab Sample ID: SBLK01
Instrument ID: A		Date Extracted: 06/18/96
atrix: (soil/water) WATER		Date Analyzed: 07/17/96
vel: (low/med) LOW		Time Analyzed: 1759

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	LCS	A1401327	07/17/96
02 SLP16FB	49697-02FB	A1501328	07/17/96
03 SLP16FBD	49697-02FD	A1601329	07/17/96
04 H6	49697-03	A1701330	07/17/96
05 MTK6	49697-04	A0101340	07/19/96
06 W48	49697-05	A0201341	07/19/96
07 SLP16	49697-01	A0301342	07/19/96
08 SLP16D	49697-01DU	A0401343	07/19/96
09 SLP16MS	49697-01MS	A0501344	07/19/96
10 SLP16MSD	49697-01MSD	A0601345	07/19/96
11 W48DL	49697-05DL	A0601387	07/26/96
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

MENTS :

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1 of 1

FORM IV SV

3/90

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

b Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

c File ID (Standard): A313

Date Analyzed: 07/17/96

Instrument ID: A

Time Analyzed: 0849

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	85178	12.01	145040	14.40	72119	21.01
UPPER LIMIT	170356	12.51	290080	14.90	144238	21.51
LOWER LIMIT	42589	11.51	72520	13.90	36060	20.51
EPA SAMPLE NO.						
1 SBLK01	87129	11.99	143874	14.38	66651	21.00
2 LCS	92406	11.99	160958	14.39	76744	21.00
3 SLP16FB	91142	11.99	165766	14.39	76719	21.00
4 SLP16FBD	94875	12.00	139771	14.39	59985	21.00
5 H6	91872	11.99	159198	14.39	77724	21.00
6						
7						
8						
9						
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
0						
1						
2						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

3 Name: QUANTERRA DENVER

### **Contract:**

Code: Case No.: 49697

SAS No. :

SDG No.: 49697

File ID (Standard): A339

Date Analyzed: 07/19/96

Instrument ID: A

Time Analyzed: 0925

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% off internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

\* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

o Name: QUANTERRA DENVER

### **Contract :**

**Code :**

Case No.: 49697

SAS No.:

SDG No.: 49697

3 File ID (Standard) : A0101382

Date Analyzed: 07/26/96

Instrument ID: A

Time Analyzed: 1107

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
AREA LOWER LIMIT = - 50% of internal standard area  
RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

## RAP SECTION 7.3 (E) MONITORING

### WELLS

SLP5 W29 W40  
W70 E3 H6  
MTK6

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

W40

Case No.: 49501      SAS No.:      SDG No.: 49501

Matrix: (soil/water) WATER      Lab Sample ID: 49501-04

Sample wt/vol: 4200 (g/ml) ML      Lab File ID: A0501281

Level: (low/med) LOW      Date Received: 06/11/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/11/96

Concentrated Extract Volume: 0.5(μl)      Date Analyzed: 07/15/96

Injection Volume: 1.0(μL)      Dilution Factor: 4.0

GPC Cleanup: (Y/N) N      pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	19	U
496-11-7-----	2,3-Dihydroindene	28	_____
95-13-6-----	1H-Indene	11	_____
91-20-3-----	Naphthalene	25	U
95-15-8-----	Benzo(b)thiophene	9.0	_____
91-22-5-----	Quinoline	5.3	U
120-72-9-----	1H-Indole	9.5	U
91-57-6-----	2-Methylnaphthalene	3.4	U
90-12-0-----	1-Methylnaphthalene	6.1	U
92-52-4-----	Biphenyl	16	U
208-96-8-----	Acenaphthylene	9.8	_____
83-32-9-----	Acenaphthene	370	_____
132-64-9-----	Dibenzofuran	3.8	U
86-73-7-----	Fluorene	3.8	U
132-65-0-----	Dibenzothiophene	5.1	_____
85-01-8-----	Phenanthrene	5.0	U
120-12-7-----	Anthracene	5.9	_____
260-94-6-----	Acridine	17	_____
86-74-8-----	Carbazole	7.2	U
206-44-0-----	Fluoranthene	5.3	U
129-00-0-----	Pyrene	42	_____
56-55-3-----	Benzo(a)Anthracene	9.5	U
218-01-9-----	Chrysene	11	U
207-08-9-----	Benzo(b)fluoranthene	9.5	U
205-08-9-----	Benzo(k)fluoranthene	8.8	U
192-97-2-----	Benzo(e)pyrene	7.2	U
50-32-8-----	Benzo(a)pyrene	8.8	U
198-55-0-----	Perylene	9.5	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	8.0	U
53-70-3-----	Dibenzo(a,h)anthracene	6.1	U
191-24-2-----	Benzo(g,h,i)perylene	11	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

E3

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 49534 SAS No.: SDG No.: 49534

Matrix: (soil/water) WATER Lab Sample ID: 49534-04

Sample wt/vol: 4160 (g/ml) ML Lab File ID: A0701320

Level: (low/med) LOW Date Received: 06/12/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/13/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/17/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L Q

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	1.3 U
95-13-6-----	1H-Indene	0.86 U
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	1.8 U
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	0.96 U
86-73-7-----	Fluorene	0.96 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	1.6 U
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H6

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 49697 SAS No.: SDG No.: 49697

atrix: (soil/water) WATER Lab Sample ID: 49697-03

ample wt/vol: 4030 (g/ml) ML Lab File ID: A1701330

evel: (low/med) LOW Date Received: 06/18/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/18/96

concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/17/96

njection Volume: 1.0 (uL) Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	5.1 U
496-11-7-----	2,3-Dihydroindene	1.4 U
95-13-6-----	1H-Indene	0.89 U
91-20-3-----	Naphthalene	6.4 U
95-15-8-----	Benzo(b)thiophene	0.89 U
91-22-5-----	Quinoline	1.4 U
120-72-9-----	1H-Indole	2.5 U
91-57-6-----	2-Methylnaphthalene	1.9 B
90-12-0-----	1-Methylnaphthalene	1.6 U
92-52-4-----	Biphenyl	4.3 U
208-96-8-----	Acenaphthylene	1.4 U
83-32-9-----	Acenaphthene	1.3 U
132-64-9-----	Dibenzofuran	0.99 U
86-73-7-----	Fluorene	0.99 U
132-65-0-----	Dibenzothiophene	1.1 U
85-01-8-----	Phenanthrene	1.4 B
120-12-7-----	Anthracene	1.1 U
260-94-6-----	Acridine	2.9 U
86-74-8-----	Carbazole	1.9 U
206-44-0-----	Fluoranthene	1.4 U
129-00-0-----	Pyrene	1.4 U
56-55-3-----	Benzo(a)Anthracene	2.5 U
218-01-9-----	Chrysene	2.8 U
207-08-9-----	Benzo(b)fluoranthene	2.5 U
205-08-9-----	Benzo(k)fluoranthene	2.3 U
192-97-2-----	Benzo(e)pyrene	1.9 U
50-32-8-----	Benzo(a)pyrene	2.3 U
198-55-0-----	Perylene	2.5 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1 U
53-70-3-----	Dibenzo(a,h)anthracene	1.6 U
191-24-2-----	Benzo(g,h,i)perylene	2.8 U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

W70

Lab Code:

Case No.: 49501

SAS No.:

SDG No.: 49501

Matrix: (soil/water) WATER

Lab Sample ID: 49501-05

Sample wt/vol: 4125 (g/ml) ML

Lab File ID: A1301298

Level: (low/med) LOW

Date Received: 06/11/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/11/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/16/96

Injection Volume: 1.0 (uL)

Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	
271-89-6-----	2,3-Benzofuran	20	U
496-11-7-----	2,3-Dihydroindene	5.4	U
95-13-6-----	1H-Indene	4.1	R
91-20-3-----	Naphthalene	25	U
95-15-8-----	Benzo(b)thiophene	3.5	U
91-22-5-----	Quinoline	5.4	U
120-72-9-----	1H-Indole	9.7	U
91-57-6-----	2-Methylnaphthalene	11	
90-12-0-----	1-Methylnaphthalene	6.2	U
92-52-4-----	Biphenyl	17	U
208-96-8-----	Acenaphthylene	14	
83-32-9-----	Acenaphthene	260	
132-64-9-----	Dibenzofuran	3.9	U
86-73-7-----	Fluorene	3.9	U
132-65-0-----	Dibenzothiophene	4.3	U
85-01-8-----	Phenanthrene	5.0	U
120-12-7-----	Anthracene	4.3	U
260-94-6-----	Acridine	11	U
86-74-8-----	Carbazole	7.4	U
206-44-0-----	Fluoranthene	5.4	U
129-00-0-----	Pyrene	53	
56-55-3-----	Benzo(a)Anthracene	9.7	U
218-01-9-----	Chrysene	11	U
207-08-9-----	Benzo(b)fluoranthene	9.7	U
205-08-9-----	Benzo(k)fluoranthene	8.9	U
192-97-2-----	Benzo(e)pyrene	7.4	U
50-32-8-----	Benzo(a)pyrene	8.9	U
198-55-0-----	Perylene	9.7	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	8.1	U
53-70-3-----	Dibenzo(a,h)anthracene	6.2	U
191-24-2-----	Benzo(g,h,i)perylene	11	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MTK6

Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49697

SAS No.:

SDG No.: 49697

Matrix: (soil/water) WATER

Lab Sample ID: 49697-04

Sample wt/vol: 4190 (g/ml) ML

Lab File ID: A0101340

Level: (low/med) LOW

Date Received: 06/18/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/18/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/19/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND			
271-89-6-----	2,3-Benzofuran	4.9	U	
496-11-7-----	2,3-Dihydroindene	1.3	U	
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	1.8	B	
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.95	U	
86-73-7-----	Fluorene	0.95	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	1.7	B	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

W29

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 49501 SAS No.: SDG No.: 49501

Matrix: (soil/water) WATER Lab Sample ID: 49501-03

Sample wt/vol: 4145 (g/ml) ML Lab File ID: A0701270

Level: (low/med) LOW Date Received: 06/11/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/11/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/12/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U	
496-11-7-----	2,3-Dihydroindene	25		
95-13-6-----	1H-Indene	0.87	U	
91-20-3-----	Naphthalene	6.3	U	
95-15-8-----	Benzo(b)thiophene	0.87	U	
91-22-5-----	Quinoline	1.4	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	1.9		
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.9		
83-32-9-----	Acenaphthene	23		
132-64-9-----	Dibenzofuran	0.96	U	
86-73-7-----	Fluorene	7.0		
132-65-0-----	Dibenzothiophene	1.5		
85-01-8-----	Phenanthrene	2.2	B	
120-12-7-----	Anthracene	1.1	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	10		
129-00-0-----	Pyrene	9.8		
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

## RAP SECTION 7.4.1 MONITORING

### WELLS

W48 W401 E2  
E7 E13 E15

## **FIRST HALF MONITORING**

13  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

W48

b Name: QUANTERRA DENVER Contract:

b Code: Case No.: 49697 SAS No.: SDG No.: 49697

Matrix: (soil/water) WATER Lab Sample ID: 49697-05

Sample wt/vol: 4085 (g/ml) ML Lab File ID: A0201341

Level: (low/med) LOW Date Received: 06/18/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/18/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/19/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran_____	5.0 U
496-11-7-----	2,3-Dihydroindene_____	38 _____
95-13-6-----	1H-Indene_____	13 _____
91-20-3-----	Naphthalene_____	6.4 U
95-15-8-----	Benzo(b)thiophene_____	8.6 _____
91-22-5-----	Quinoline_____	3.4 _____
120-72-9-----	1H-Indole_____	5.2 _____
91-57-6-----	2-Methylnaphthalene_____	0.88 U
90-12-0-----	1-Methylnaphthalene_____	1.6 U
92-52-4-----	Biphenyl_____	4.2 U
208-96-8-----	Acenaphthylene_____	6.2 _____
83-32-9-----	Acenaphthene_____	110 _____
132-64-9-----	Dibenzofuran_____	0.98 U
86-73-7-----	Fluorene_____	4.9 _____
132-65-0-----	Dibenzothiophene_____	2.8 _____
85-01-8-----	Phenanthrene_____	2.8 RB
120-12-7-----	Anthracene_____	5.9 _____
260-94-6-----	Acridine_____	42 _____
36-74-8-----	Carbazole_____	9.4 _____
206-44-0-----	Fluoranthene_____	4.7 _____
129-00-0-----	Pyrene_____	7.8 _____
56-55-3-----	Benzo(a)Anthracene_____	2.4 U
218-01-9-----	Chrysene_____	2.7 U
207-08-9-----	Benzo(b)fluoranthene_____	2.4 U
205-08-9-----	Benzo(k)fluoranthene_____	2.2 U
192-97-2-----	Benzo(e)pyrene_____	1.9 U
50-32-8-----	Benzo(a')pyrene_____	2.2 U
198-55-0-----	Perylene_____	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene_____	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene_____	1.6 U
191-24-2-----	Benzo(g,h,i)perylene_____	2.7 U

<sup>1B</sup>  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

W48DL

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 49697 SAS No.: SDG No.: 49697

Matrix: (soil/water) WATER Lab Sample ID: 49697-05DL

Sample wt/vol: 4085 (g/ml) ML Lab File ID: A0601387

Level: (low/med) LOW Date Received: 06/18/96

% Moisture: \_\_\_\_\_ Date Extracted: 06/16/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 07/26/96

Injection Volume: 1.0 (uL) Dilution Factor: 5.0

EPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
---------	----------	---	------	---

271-89-6-----	2,3-Benzofuran	25	U
496-11-7-----	2,3-Dihydroindene	55	D
95-13-6-----	1H-Indene	18	D
91-20-3-----	Naphthalene	32	U
95-15-8-----	Benzo(b)thiophene	10	D
91-22-5-----	Quincline	6.8	U
120-72-9-----	1H-Indole	12	U
91-57-6-----	2-Methylnaphthalene	4.4	U
90-12-0-----	1-Methylnaphthalene	7.8	U
92-52-4-----	Biphenyl	21	U
208-96-8-----	Acenaphthylen	6.8	U
83-32-9-----	Acenaphthene	120	D
132-64-9-----	Dibenzofuran	4.9	U
86-73-7-----	Fluorene	5.5	D
132-65-0-----	Dibenzothiophene	5.4	U
85-01-8-----	Phenanthrene	6.4	U
120-12-7-----	Anthracene	5.6	D
260-94-6-----	Acridine	35	D
86-74-8-----	Carbazole	9.3	U
206-44-0-----	Fluoranthene	6.8	U
129-00-0-----	Pyrene	9.6	D
56-55-3-----	Benzo(a)Anthracene	12	U
218-01-9-----	Chrysene	14	U
207-08-9-----	Benzo(b)fluoranthene	12	U
205-08-9-----	Benzo(k)fluoranthene	11	U
192-97-2-----	Benzo(e)pyrene	9.3	U
50-32-8-----	Benzo(a)pyrene	11	U
198-55-0-----	Perylene	12	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10	U
53-70-3-----	Dibenzo(a,h)anthracene	7.8	U
191-24-2-----	Benzo(g,h,i)perylene	14	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

W401

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49534

SAS No.:

SDG No.: 49534

Matrix: (soil/water) WATER

Lab Sample ID: 49534-08

Sample wt/vol: 4160 (g/ml) ML

Lab File ID: A1101324

Level: (low/med) LOW

Date Received: 06/12/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/13/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/17/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND		
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	6.2	
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.0	
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	6.3	
132-64-9-----	Dibenzofuran	0.96	U
86-73-7-----	Fluorene	2.3	
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.8	
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

E2

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 49534

SAS No.:

SDG No.: 49534

Matrix: (soil/water) WATER

Lab Sample ID: 49534-03

Sample wt/vol: 4160 (g/ml) ML

Lab File ID: A0601319

Level: (low/med) LOW

Date Received: 06/12/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 06/13/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 07/17/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydrcindene	4.6 U
95-13-6-----	1H-Indene	0.86 U
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	3.5 U
90-12-0-----	1-Methylnaphthalene	1.6 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthyliene	1.3 U
83-32-9-----	Acenaphthene	1.6 U
132-64-9-----	Dibenzofuran	0.96 U
86-73-7-----	Fluorene	0.96 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	2.6 U
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

E7

Lab Name:	QUANTERRA DENVER	Contract:	
Lab Code:	Case No.: 49534	SAS No.:	SDG No.: 49534
Matrix:	(soil/water) WATER	Lab Sample ID:	49534-05
Sample wt/vol:	4160 (g/ml) ML	Lab File ID:	A0801321
Level:	(low/med) LOW	Date Received:	06/12/96
% Moisture:	decanted: (Y/N)	Date Extracted:	06/13/96
Concentrated Extract Volume:	0.5 (ml)	Date Analyzed:	07/17/96
Injection Volume:	1.0 (uL)	Dilution Factor:	1.0
GPC Cleanup:	(Y/N) N	pH:	7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U	
496-11-7-----	2,3-Dihydroindene	1.3	U	
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	1.7	U	
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.96	U	
86-73-7-----	Fluorene	0.96	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	1.4	U	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(q,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

E13

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 49534 SAS No.: SDG No.: 49534

Matrix: (soil/water) WATER Lab Sample ID: 49534-06

Sample wt/vol: 4120 (g/ml) ML Lab File ID: A0901322

Level: (low/med) LOW Date Received: 06/12/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 06/13/96

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 07/17/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L Q

271-89-6-----	2,3-Benzofuran	5.0	U
496-11-7-----	2,3-Dihydroindene	1.4	U
95-13-6-----	1H-Indene	0.87	U
91-20-3-----	Naphthalene	6.3	U
95-15-8-----	Benzo(b)thiophene	0.87	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.0	
90-12-0-----	1-Methylnaphthalene	1.6	U
92-52-4-----	Biphenyl	4.2	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	0.97	U
86-73-7-----	Fluorene	0.97	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	1.5	
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

E15

Lab Name:	QUANTERRA DENVER	Contract:	
Lab Code:	Case No.: 49534	SAS No.:	SDG No.: 49534
Matrix:	(soil/water) WATER	Lab Sample ID:	49534-07
Sample wt/vol:	4155 (g/ml) ML	Lab File ID:	A1001323
Level:	(low/med) LOW	Date Received:	06/12/96
% Moisture:	_____	Date Extracted:	06/13/96
Concentrated Extract Volume:	0.5 (ml)	Date Analyzed:	07/17/96
Injection Volume:	1.0 (uL)	Dilution Factor:	1.0
GPC Cleanup:	(Y/N) N	pH:	7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U	
496-11-7-----	2,3-Dihydroindene	1.3	U	
95-13-6-----	1H-Indene	0.87	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.87	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	4.0	U	
90-12-0-----	1-Methylnaphthalene	2.0	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.96	U	
86-73-7-----	Fluorene	0.98	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	3.2	U	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)Fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

## **SECOND HALF MONITORING**

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303-421-6611 Telephone  
303-431-7171 Fax

**CASE NARRATIVE**

**FOR**

**City of St. Louis Park**

**November 21, 1996**

**Quanterra Environmental Services**

**Project Number 051936**

**Introduction**

Eight aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on October 9, 1996. The samples were logged in under Quanterra Denver's project number 051936. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

**Data Quality Assessment**

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

There are no reportable anomalies associated with this project.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By:

Kurt C. Ill

Date:

11/21/96

Kurt C. Ill  
Program Manager

Reviewed By:

Wim LaRivise

Date:

11/21/96

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-E2

Lab Name: QUANTERRA DENVER Contract:

Case No.: 51936 SAS No.: SDG No.: 51936

Matrix: (soil/water) WATER Lab Sample ID: 51936-01

Sample wt/vol: 4180 (g/ml) ML Lab File ID: A0901121

Level: (low/med) LOW Date Received: 10/09/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/10/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/17/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U	
496-11-7-----	2,3-Dihydroindene	4.0		
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	2.2	B	
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.9		
132-64-9-----	Dibenzofuran	1.2	RB	
86-73-7-----	Fluorene	1.0		
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	5.1	B	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.8		
129-00-0-----	Pyrene	2.3		
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-E2D

Name: QUANTERRA DENVER	Contract:	
Code: Case No.: 51936	SAS No.:	SDG No.: 51936
Fix: (soil/water) WATER	Lab Sample ID: 51936-01DU	
Ple wt/vol: 4180 (g/ml) ML	Lab File ID: A1001122	
al: (low/med) LOW	Date Received: 10/09/96	
oisture: _____ decanted: (Y/N) _____	Date Extracted: 10/10/96	
centrated Extract Volume: 0.5 (ml)	Date Analyzed: 10/17/96	
ection Volume: 1.0 (uL)	Dilution Factor: 1.0	
Cleanup: (Y/N) N	pH: 7.0	

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	3.7 _____
95-13-6-----	1H-Indene	0.91 _____
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	1.8 B
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.6 _____
132-64-9-----	Dibenzofuran	0.96 U
86-73-7-----	Fluorene	0.96 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	4.4 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.4 _____
129-00-0-----	Pyrene	1.9 _____
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

**1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**PCJ-E2FB**

Name: QUANTERRA DENVER	Contract:	
C : Case No.: 51936	SAS No.:	SDG No.: 51936
Matrix: (soil/water) WATER	Lab Sample ID: 51936-02FB	
Sample wt/vol: 4180 (g/ml) ML	Lab File ID: A1101123	
Rel: (low/med) LOW	Date Received: 10/09/96	
Decanture: _____ decanted: (Y/N) _____	Date Extracted: 10/10/96	
Concentrated Extract Volume: 0.5 (ml)	Date Analyzed: 10/17/96	
Injection Volume: 1.0 (uL)	Dilution Factor: 1.0	
Cleanup: (Y/N) N	pH: 7.0	

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	NG/L
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.3	B
90-12-0-----	1-Methylnaphthalene	2.2	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	1.0	B
86-73-7-----	Fluorene	0.96	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	4.4	B
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-E2FBD
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Lab Name: QUANTERRA DENVER Contract:

Lab Code: Case No.: 51936 SAS No.: SDG No.: 51936

Matrix: (soil/water) WATER Lab Sample ID: 51936-02FD

Sample wt/vol: 4180 (g/ml) ML Lab File ID: A1201124

Level: (low/med) LOW Date Received: 10/09/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/10/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/17/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
			Q
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	1.5	_____
95-13-6-----	1H-Indene	0.95	_____
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.5	B
90-12-0-----	1-Methylnaphthalene	2.4	_____
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	1.0	B
86-73-7-----	Fluorene	0.96	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	3.9	B
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-E7

Lab Name: QUANTERRA DENVER

Contract:

La bode: Case No.: 51936 SAS No.: SDG No.: 51936

Matrix: (soil/water) WATER Lab Sample ID: 51936-03

Sample wt/vol: 4185 (g/ml) ML Lab File ID: A0501117

Level: (low/med) LOW Date Received: 10/09/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/10/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/17/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U	
496-11-7-----	2,3-Dihydroindene	1.3	U	
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	1.7	B	
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.96	U	
86-73-7-----	Fluorene	0.96	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	2.9	B	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMOVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-E-15

Name: QUANTERRA DENVER	Contract:
Code: Case No.: 51936	SAS No.: SDG No.: 51936
Matrix: (soil/water) WATER	Lab Sample ID: 51936-05
Sample wt/vol: 4105 (g/ml) ML	Lab File ID: A0701119
Level: (low/med) LOW	Date Received: 10/09/96
Moisture: _____	Date Extracted: 10/10/96
Concentrated Extract Volume: 0.5 (ml)	Date Analyzed: 10/17/96
Injection Volume: 1.0 (uL)	Dilution Factor: 1.0
Cleanup: (Y/N) N	pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	
271-89-6-----	2,3-Benzofuran	5.0	U
496-11-7-----	2,3-Dihydroindene	1.4	U
95-13-6-----	1H-Indene	0.88	U
91-20-3-----	Naphthalene	6.3	U
95-15-8-----	Benzo(b)thiophene	0.88	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	15	B
90-12-0-----	1-Methylnaphthalene	8.1	—
92-52-4-----	Biphenyl	4.2	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	1.1	B
86-73-7-----	Fluorene	0.97	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	4.5	B
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-E-13

Name: QUANTERRA DENVER

Contract:

Case : Case No.: 51936 SAS No.: SDG No.: 51936

atrix: (soil/water) WATER Lab Sample ID: 51936-06

ngle wt/vol: 4190 (g/ml) ML Lab File ID: A0801120

el: (low/med) LOW Date Received: 10/09/96

oisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/10/96

ncentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/17/96

jection Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	1.3 U
95-13-6-----	1H-Indene	0.86 U
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	1.8 B
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	0.95 U
86-73-7-----	Fluorene	0.95 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	3.6 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

**2C**  
**WATER SEMIVOLATILE SURROGATE RECOVERY**

Name: QUANTERRA DENVER

### **Contract:**

**Code:**

Case No.: 51936

SAS No.:

SDG No.: 51936

## QC LIMITS

S1 = Naphthalene-d8

(21-108)

S2 = Chrysene-d12

(10-118)

S3 = Fluorene-d10

(41-162)

# Column to be used to flag recovery values  
\* Values outside of contract required QC limits  
D Surrogate diluted out

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Name: QUANTERRA DENVER

Contract:

SDG No.: 51936

Case No.: 51936

SAS No.:

Lab Sample ID: SBLK01

File ID: A0101113

Date Extracted: 10/10/96

Instrument ID: A

Date Analyzed: 10/17/96

Matrix: (soil/water) WATER

Time Analyzed: 0938

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 DCS1	51936-DCS1	A0301115	10/17/96
02 DCS2	51936-DCS2	A0401116	10/17/96
03 PCJ-E7	51936-03	A0501117	10/17/96
04 PCJ-E-15	51936-05	A0701119	10/17/96
05 PCJ-E-13	51936-06	A0801120	10/17/96
06 PCJ-E2	51936-01	A0901121	10/17/96
07 PCJ-E2D	51936-01DU	A1001122	10/17/96
08 PCJ-E2FB	51936-02FB	A1101123	10/17/96
09 PCJ-E2FBD	51936-02FD	A1201124	10/17/96
10 <del>PCJ</del> -P116	51936-04	A1301125	10/17/96
11 STP			
12			
13			
14			
15			
16			
17			
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19			
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23			
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27			
28			
29			
30			

COMMENTS:

\_\_\_\_\_

e 1 of 1

FORM IV SV

OLM03.0

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 51936

SAS No.:

SDG No.: 51936

File ID (Standard): A112

Date Analyzed: 10/17/96

Instrument ID: A

Time Analyzed: 0826

	IS1 (ANT) AREA #	RT #	IS2 (PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	125806	12.43	183993	14.86	69013	21.47
UPPER LIMIT	251612	12.93	367986	15.36	138026	21.97
LOWER LIMIT	62903	11.93	91996	14.36	34506	20.97
EPA SAMPLE NO.						
1 SBLK01	121384	12.42	185883	14.86	71444	21.47
2 DCS1	110246	12.42	167566	14.85	68131	21.45
3 DCS2	129594	12.41	195625	14.84	78201	21.45
4 PCJ-E7	120226	12.41	184287	14.84	82406	21.45
5 PCJ-E-15	139059	12.41	209892	14.84	95930	21.45
6 PCJ-E-13	121966	12.41	192736	14.84	92442	21.45
7 PCJ-E2	126614	12.41	191471	14.84	89842	21.45
8 PCJ-E2D	150807	12.41	213026	14.84	85417	21.45
9 PCJ-E2FB	135399	12.40	202173	14.84	86384	21.44
10 PCJ-E2FBD	111359	12.40	162908	14.84	59990	21.45
11 P116	127407	12.41	172870	14.84	98114	21.44
12 STP						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 51936 SAS No.:

SDG No.: 51936

EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
J1 SBLK01	84	74	63						0
J2 DCS1	94	82	74						0
J3 DCS2	92	80	74						0
J4 PCJ-E7	91	34	81						0
J5 PCJ-E-15	78	26	69						0
J6 PCJ-E-13	84	30	68						0
J7 PCJ-E2	86	34	73						0
J8 PCJ-E2D	79	35	71						0
J9 PCJ-E2FB	82	72	65						0
J0 PCJ-E2FBD	94	86	76						0
J1 P116	69	20	62						0
12 STP									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

Name: QUANTERRA DENVER

Contract:

SBLK01

Code: Case No.: 51936

SAS No.:

SDG No.: 51936

File ID: A0101113

Lab Sample ID: SBLK01

Instrument ID: A

Date Extracted: 10/10/96

Matrix: (soil/water) WATER

Date Analyzed: 10/17/96

Level: (low/med) LOW

Time Analyzed: 0938

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 DCS1	51936-DCS1	A0301115	10/17/96
02 DCS2	51936-DCS2	A0401116	10/17/96
03 PCJ-E7	51936-03	A0501117	10/17/96
04 PCJ-E-15	51936-05	A0701119	10/17/96
05 PCJ-E-13	51936-06	A0801120	10/17/96
06 PCJ-E2	51936-01	A0901121	10/17/96
07 PCJ-E2D	51936-01DU	A1001122	10/17/96
08 PCJ-E2FB	51936-02FB	A1101123	10/17/96
09 PCJ-E2FBD	51936-02FD	A1201124	10/17/96
10 <del>PCJ</del> -P116	51936-04	A1301125	10/17/96
11 STP			
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COMMENTS:

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e 1 of 1

FORM IV SV

OLM03.0

<sup>8B</sup>  
SEMOVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

b Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 51936

SAS No.:

SDG No.: 51936

b File ID (Standard): A112

Date Analyzed: 10/17/96

Instrument ID: A

Time Analyzed: 0826

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	125806	12.43	183993	14.86	69013	21.47
UPPER LIMIT	251612	12.93	367986	15.36	138026	21.97
LOWER LIMIT	62903	11.93	91996	14.36	34506	20.97
EPA SAMPLE NO.						
01 SBLK01	121384	12.42	185883	14.86	71444	21.47
02 DCS1	110246	12.42	167566	14.85	68131	21.45
03 DCS2	129594	12.41	195625	14.84	78201	21.45
04 PCJ-E7	120226	12.41	184287	14.84	82406	21.45
05 PCJ-E-15	139059	12.41	209892	14.84	95930	21.45
06 PCJ-E-13	121966	12.41	192736	14.84	92442	21.45
07 PCJ-E2	126614	12.41	191471	14.84	89842	21.45
08 PCJ-E2D	150807	12.41	213026	14.84	85417	21.45
09 PCJ-E2FB	135399	12.40	202173	14.84	86384	21.44
10 PCJ-E2FBD	111359	12.40	162908	14.84	59990	21.45
11 <del>PCJ-E</del> -P116	127407	12.41	172870	14.84	98114	21.44
2 STP						
3						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DCS1

Lab Name: QUANTERRA DENVER	Contract:	
Lab Code: Case No.: 51936	SAS No.:	SDG No.: 51936
Matrix: (soil/water) WATER	Lab Sample ID: 51936-DCS1	
Sample wt/vol: 4000 (g/ml) ML	Lab File ID: A0301115	
Level: (low/med) LOW	Date Received: _____	
Moisture: _____ decanted: (Y/N) _____	Date Extracted: 10/10/96	
Concentrated Extract Volume: 0.5 (mL)	Date Analyzed: 10/17/96	
Injection Volume: 1.0 (uL)	Dilution Factor: 1.0	
PC Cleanup: (Y/N) N	pH: 7.0	

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
95-13-6-----	1H-Indene_____	9.4	_____
91-20-3-----	Naphthalene_____	12	_____
91-22-5-----	Quinoline_____	9.8	_____
91-57-6-----	2-Methylnaphthalene_____	11	_____
86-73-7-----	Fluorene_____	9.4	_____
218-01-9-----	Chrysene_____	6.3	_____
192-97-2-----	Benzo(e)pyrene_____	8.5	_____

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DCS2

b Name: QUANTERRA DENVER Contract: \_\_\_\_\_  
 b le: Case No.: 51936 SAS No.: SDG No.: 51936  
 Matrix: (soil/water) WATER Lab Sample ID: 51936-DCS2  
 ample wt/vol: 4000 (g/ml) ML Lab File ID: A0401116  
 level: (low/med) LOW Date Received: \_\_\_\_\_  
 Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/10/96  
 Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/17/96  
 jection Volume: 1.0 (uL) Dilution Factor: 1.0  
 PC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
95-13-6-----	1H-Indene_____		8.6	_____
91-20-3-----	Naphthalene_____		11	_____
91-22-5-----	Quinoline_____		9.3	_____
91-57-6-----	2-Methylnaphthalene_____		9.9	_____
86-73-7-----	Fluorene_____		8.6	_____
218-01-9-----	Chrysene_____		6.0	_____
192-97-2-----	Benzo(e)pyrene_____		7.6	_____

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Name: QUANTERRA DENVER

Contract:

SBLK01

Code: Case No.: 51936 SAS No.: SDG No.: 51936  
 Matrix: (soil/water) WATER Lab Sample ID: SBLK01  
 Sie wt/vol: 4000 (g/ml) ML Lab File ID: A0101113  
 L: (low/med) LOW Date Received: \_\_\_\_\_  
 Distilled: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/10/96  
 Extracted Extract Volume: 0.5 (ml) Date Analyzed: 10/17/96  
 Reaction Volume: 1.0 (uL) Dilution Factor: 1.0  
 Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	5.1	U	
496-11-7-----	2,3-Dihydroindene	1.4	U	
95-13-6-----	1H-Indene	0.90	U	
91-20-3-----	Naphthalene	6.5	U	
95-15-8-----	Benzo(b)thiophene	0.90	U	
91-22-5-----	Quinoline	1.4	U	
120-72-9-----	1H-Indole	2.5	U	
91-57-6-----	2-Methylnaphthalene	1.6		
90-12-0-----	1-Methylnaphthalene	1.6	U	
92-52-4-----	Biphenyl	4.3	U	
208-96-8-----	Acenaphthylene	1.4	U	
83-32-9-----	Acenaphthene	1.3	U	
132-64-9-----	Dibenzofuran	1.0	R	
86-73-7-----	Fluorene	1.0	U	
132-65-0-----	Dibenzothiophene	1.1	U	
85-01-8-----	Phenanthrene	3.4		
120-12-7-----	Anthracene	1.1	U	
260-94-6-----	Acridine	2.9	U	
86-74-8-----	Carbazole	1.9	U	
206-44-0-----	Fluoranthene	1.4	U	
129-00-0-----	Pyrene	1.4	U	
56-55-3-----	Benzo(a)Anthracene	2.5	U	
218-01-9-----	Chrysene	2.8	U	
207-08-9-----	Benzo(b)fluoranthene	2.5	U	
205-08-9-----	Benzo(k)fluoranthene	2.3	U	
192-97-2-----	Benzo(e)pyrene	1.9	U	
50-32-8-----	Benzo(a)pyrene	2.3	U	
198-55-0-----	Perylene	2.5	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U	
191-24-2-----	Benzo(g,h,i)perylene	2.8	U	

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303 421-6611 Telephone  
303 431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

November 23, 1996

Quanterra Environmental Services

Project Number 052075

### Introduction

Nine aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on October 16, 1996. The samples were logged in under Quanterra Denver's project number 052075. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) extended list polynuclear aromatic hydrocarbons (PAH).

### Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

Benzo (e) pyrene was not recovered in either the matrix spike or matrix spike duplicate samples. Benzo (e) pyrene was recovered within acceptable limits in the Laboratory Control Sample. Matrix effect is indicated.

4-Nitrophenol was recovered at 92% and 90% in the matrix spike and matrix spike duplicate samples. These recoveries are good, however, they are outside the 10% to 90% historical limits and are flagged on the data sheets.



This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By: Kurt C. Ill Date: 11/23/96  
Kurt C. Ill  
Program Manager

Reviewed By: J. R. Laffey Date: 11/23/96

**Chain of Custody  
Record**

QUA-4124-1

**Quanterra**  
Environmental  
Services

Client  
City of St Louis Park

Address  
5305 Minnetonka Blvd

City  
St. Louis Park

State  
MN

Zip Code  
55416

Project Manager

Scott Anderson

Telephone Number (Area Code)/Fax Number

(612) 924-2557

Date

10-10-96

Chain Of Custody Number

69888

Lab Number

Page 1 of 1

Site Contact

Billie e.g.y

Lab Contact

Kurt J.I.

Analysis (Attach list if  
more space is needed)

PPT-P44-5

Carrier/Waybill Number

Project Name

Reilly Site

Contract/Purchase Order/Quote No.

Special Instructions/  
Conditions of Receipt

**Sample I.D. No. and Description**

(Containers for each sample may be combined on one line)

OPV-W401-100896 (6L)

Date

Time

Aqueous

Sed.

Soil

Unpres.

H<sub>2</sub>SO<sub>4</sub>

HNO<sub>3</sub>

HCl

NaOH

ZnAC

NaOH

X

-65

Possible Hazard Identification

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Sample Disposal

Return To Client  Disposal By Lab  Archive For

(A fee may be assessed if samples are retained  
longer than 3 months)

Turn Around Time Required

24 Hours  48 Hours  7 Days  14 Days  21 Days  Other \_\_\_\_\_

QC Requirements (Specify)

1. Relinquished By

Clarey Johnson

Date Time

10-10-96 1415

1. Received By

J. Bell

Date Time

10/16/96 9:00

2. Relinquished By

Date Time

2. Received By

J. Bell

Date Time

3. Relinquished By

Date Time

3. Received By

Date Time

Comments

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DP-W401

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 52075

SAS No.:

SDG No.: 52075

Matrix: (soil/water) WATER

Lab Sample ID: 52075-05

Sample wt/vol: 3980 (g/ml) ML

Lab File ID: A1301161

Level: (low/med) LOW

Date Received: 10/16/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 10/16/96

Concentrated Extract Volume: 0.5 (ml)

Date Analyzed: 10/26/96

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

271-89-6-----	2,3-Benzofuran	5.1	U
496-11-7-----	2,3-Dihydroindene	8.1	
95-13-6-----	1H-Indene	0.90	U
91-20-3-----	Naphthalene	6.5	U
95-15-8-----	Benzo(b)thiophene	0.90	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.5	U
91-57-6-----	2-Methylnaphthalene	1.5	B
90-12-0-----	1-Methylnaphthalene	1.6	U
92-52-4-----	Biphenyl	4.3	U
208-96-8-----	Acenaphthylene	1.6	R
83-32-9-----	Acenaphthene	10	
132-64-9-----	Dibenzofuran	1.0	U
86-73-7-----	Fluorene	4.1	
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	3.8	B
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.9	U
86-74-8-----	Carbazole	1.9	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.5	U
218-01-9-----	Chrysene	2.8	U
207-08-9-----	Benzo(b)fluoranthene	2.5	U
205-08-9-----	Benzo(k)fluoranthene	2.3	U
192-97-2-----	Benzo(e)pyrene	1.9	U
50-32-8-----	Benzo(a)pyrene	2.3	U
198-55-0-----	Perylene	2.5	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.8	U

## SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

by: QUANTERRA DENVER

Contract:

GAC-SLP4T

de: Case No.: 52075 SAS No.: SDG No.: 52075

(soil/water) WATER Lab Sample ID: 52075-01

wt/vol: 4200 (g/ml) ML Lab File ID: A0501153

(low/mid) LOW Date Received: 10/16/96

sture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/16/96

ntrated Extract Volume: 0.5 (ml) Date Analyzed: 10/25/96

dition Volume: 1.0 (uL) Dilution Factor: 1.0

leanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.8 U
496-11-7-----	2,3-Dihydroindene	1.3 U
95-13-6-----	1H-Indene	0.86 U
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
11-22-5-----	Quincline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	1.8 B
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	1.2 U
86-73-7-----	Fluorene	1.0 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	5.8 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

<sup>1B</sup>  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GAC-SLP4T
-----------

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 52075 SAS No.: SDG No.: 52075

ix: (soil/water) WATER Lab Sample ID: 52075-01

le wt/vol: 1053 (g/ml) ML Lab File ID: E3295

el: (low/med) LOW Date Received: 10/16/96

cisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/21/96

centrated Extract Volume: 1.0 (ml) Date Analyzed: 11/05/96

ection Volume: 2.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
( $\mu$ g/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L
108-95-2-----	Phenol	9 U
95-57-8-----	2-Chlorophenol	9 U
95-48-7-----	2-Methylphenol	9 U
106-44-5-----	4-Methylphenol	9 U
88-75-5-----	2-Nitrophenol	9 U
105-67-9-----	2,4-Dimethylphenol	9 U
120-83-2-----	2,4-Dichlorophenol	9 U
59-50-7-----	4-Chloro-3-Methylphenol	9 U
88-06-2-----	2,4,6-Trichlorophenol	9 U
95-95-4-----	2,4,5-Trichlorophenol	24 U
51-28-5-----	2,4-Dinitrophenol	24 U
100-02-7-----	4-Nitrophenol	24 U
534-52-1-----	4,6-Dinitro-2-methylphenol	24 U
87-86-5-----	Pentachlorophenol	24 U

1B  
SEMOVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab: QUANTERRA DENVER

Contract:

GAC-SLP4TD

Case No.: 52075      SAS No.: SDG No.: 52075

(soil/water) WATER      Lab Sample ID: 52075-01DU

wt/vol: 4200 (g/ml) ML      Lab File ID: A0601154

(low/med) LOW      Date Received: 10/16/96

ture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/16/96

Extracted Extract Volume: 0.5 (ml)      Date Analyzed: 10/25/96

tion Volume: 1.0 (uL)      Dilution Factor: 1.0

leanup: (Y/N) N      pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND			
271-89-6-----	2,3-Benzofuran	4.8	U	
496-11-7-----	2,3-Dihydroindene	1.3	U	
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
105-15-8-----	Benzo(b)thiophene	0.86	U	
122-5-----	Quinoline	1.3	U	
130-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	1.4	B	
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.95	U	
86-73-7-----	Fluorene	0.95	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	4.8	B	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GAC-SLP4TD

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 52075 SAS No.: SDG No.: 52075

ix: (soil/water) WATER Lab Sample ID: 52075-01DU

le wt/vol: 1055 (g/ml) ML Lab File ID: E3296

el: (low/med) LOW Date Received: 10/16/96

cisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/21/96

centrated Extract Volume: 1.0 (ml) Date Analyzed: 11/05/96

ection Volume: 2.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol		9	U
95-57-8-----	2-Chlorophenol		9	U
95-48-7-----	2-Methylphenol		9	U
106-44-5-----	4-Methylphenol		9	U
88-75-5-----	2-Nitrophenol		9	U
105-67-9-----	2 4-Dimethylphenol		9	U
120-83-2-----	2 4-Dichlorophenol		9	U
59-50-7-----	4-Chloro-3-Methylphenol		9	U
88-06-2-----	2 4 6-Trichlorophenol		9	U
95-95-4-----	2 4 5-Trichlorophenol		24	U
51-28-5-----	2 4-Dinitrophenol		24	U
100-02-7-----	4-Nitrophenol		24	U
534-52-1-----	4 6-Dinitro-2-methylphenol		24	U
87-86-5-----	Pentachlorophenol		24	U

<sup>1B</sup>  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GAC-SLP4TMS

By: QUANTERRA DENVER

Contract:

SDG No.: 52075

Code: Case No.: 52075 SAS No.: SDG No.: 52075  
 Matrix: (soil/water) WATER Lab Sample ID: 52075-01MS  
 Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0701155  
 Level: (low/med) LOW Date Received: 10/16/96  
 Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/16/96  
 Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/25/96  
 Injection Volume: 1.0 (uL) Dilution Factor: 1 : 1  
 C Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.8 U
496-11-7-----	2,3-Dihydroindene	1.3 U
95-13-6-----	1H-Indene	8.6 _____
91-20-3-----	Naphthalene	10 _____
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	8.0 _____
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	9.8 B
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	0.95 U
86-73-7-----	Fluorene	8.5 _____
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	5.2 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	3.4 _____
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GAC-SLP4TMS

o Name: QUANTERRA DENVER Contract:

h Code: Case No.: 52075 SAS No.: SDG No.: 52075

trix: (soil/water) WATER Lab Sample ID: 52075-01MS

sample wt/vol: 1055 (g/ml) ML Lab File ID: E3297

vel: (low/med) LOW Date Received: 10/16/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/21/96

ncentrated Extract Volume: 1.0 (ml) Date Analyzed: 11/05/96

jection Volume: 2.0 (uL) Dilution Factor: 1.0

C Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q	
		UG/L	Q
108-95-2-----	Phenol	52	_____
95-57-8-----	2-Chlorophenol	55	_____
95-48-7-----	2-Methylphenol	9	U
106-44-5-----	4-Methylphenol	9	U
88-75-5-----	2-Nitrophenol	9	U
105-67-9-----	2 4-Dimethylphenol	9	U
120-83-2-----	2 4-Dichlorophenol	9	U
59-50-7-----	4-Chloro-3-Methylphenol	53	_____
88-06-2-----	2 4 6-Trichlorophenol	9	U
95-95-4-----	2 4 5-Trichlorophenol	24	U
51-28-5-----	2 4-Dinitrophenol	24	U
100-02-7-----	4-Nitrophenol	65	_____
534-52-1-----	4 6-Dinitro-2-methylphenol	24	U
87-86-5-----	Pentachlorophenol	60	_____

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

No.	QUANTERRA DENVER	Contract:	GAC-SLP4TMSD
Code:	Case No.: 52075	SAS No.:	SDG No.: 52075
ix: (soil/water)	WATER	Lab Sample ID:	52075-01MSD
le wt/vol:	4200 (g/ml) ML	Lab File ID:	A0801156
el: (low/med)	LOW	Date Received:	10/16/96
oisture:	decanted: (Y/N)	Date Extracted:	10/16/96
centrated Extract Volume:	0.5(ml)	Date Analyzed:	10/25/96
ection Volume:	1.0 (uL)	Dilution Factor:	1.0
Cleanup:	(Y/N) N	pH:	7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.8 U
496-11-7-----	2,3-Dihydroindene	1.3 U
95-13-6-----	1H-Indene	8.5
91-20-3-----	Naphthalene	10
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	8.8
20-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	9.6 B
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	0.98
86-73-7-----	Fluorene	8.3
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	5.0 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	3.5
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GAC-SLP4TMSD

b Name: QUANTERRA DENVER

Contract:

Code: Case No.: 52075 SAS No.: SDG No.: 52075

atrix: (soil/water) WATER Lab Sample ID: 52075-01SD

sample wt/vol: 1059 (g/ml) ML Lab File ID: E3298

vel: (low/med) LOW Date Received: 10/16/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/21/96

ncentrated Extract Volume: 1.0 (ml) Date Analyzed: 11/05/96

jection Volume: 2.0 ( $\mu$ L) Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
( $\mu$ g/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
108-95-2-----	Phenol	51	
95-57-8-----	2-Chlorophenol	55	
95-48-7-----	2-Methylphenol	9	U
106-44-5-----	4-Methylphenol	9	U
88-75-5-----	2-Nitrophenol	9	U
105-67-9-----	2,4-Dimethylphenol	9	U
120-83-2-----	2,4-Dichlorophenol	9	U
59-50-7-----	4-Chloro-3-Methylphenol	54	
88-06-2-----	2,4,6-Trichlorophenol	9	U
95-95-4-----	2,4,5-Trichlorophenol	24	U
51-28-5-----	2,4-Dinitrophenol	24	U
100-02-7-----	4-Nitrophenol	64	
534-52-1-----	4,6-Dinitro-2-methylphenol	24	U
87-86-5-----	Pentachlorophenol	61	

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

No. QUANTERRA DENVER

Contract:

GAC-SLP4TFB

Code: Case No.: 52075 SAS No.: SDG No.: 52075  
 ix: (soil/water) WATER Lab Sample ID: 52075-02FB  
 le wt/vol: 4180 (g/ml) ML Lab File ID: A0901157  
 l: (low/med) LOW Date Received: 10/16/96  
 isture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/16/96  
 centrated Extract Volume: 0.5 (ml) Date Analyzed: 10/25/96  
 ection Volume: 1.0 (uL) Dilution Factor: 1.0  
 Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	1.3 U
95-13-6-----	1H-Indene	0.86 U
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
.20-72-9-----	1H-Indole	2.4 U
.31-57-6-----	2-Methylnaphthalene	2.4 B
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	1.2 _____
86-73-7-----	Fluorene	1.1 _____
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	5.9 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.6 _____
129-00-0-----	Pyrene	1.4 _____
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3- <i>cd</i> )pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

**1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET**

EPA SAMPLE NO.

Name: QUANTERRA DENVER

Contract:

GAC-SLP4TFB

Code: Case No.: 52075 SAS No.: SDG No.: 52075

Matrix: (soil/water) WATER Lab Sample ID: 52075-02FB

Sample wt/vol: 1049 (g/ml) ML Lab File ID: E3299

Sal: (low/med) LOW Date Received: 10/16/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/21/96

Concentrated Extract Volume: 1.0 (ml) Date Analyzed: 11/05/96

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L Q

108-95-2-----	Phenol	10	U
95-57-8-----	2-Chlorophenol	10	U
95-48-7-----	2-Methylphenol	10	U
106-44-5-----	4-Methylphenol	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2 4-Dimethylphenol	10	U
120-83-2-----	2 4-Dichlorophenol	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
88-06-2-----	2 4 6-Trichlorophenol	10	U
95-95-4-----	2 4 5-Trichlorophenol	24	U
51-28-5-----	2 4-Dinitrophenol	24	U
100-02-7-----	4-Nitrophenol	24	U
534-52-1-----	4 6-Dinitro-2-methylphenol	24	U
87-86-5-----	Pentachlorophenol	24	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GAC-SLP4TFBD

No. : QUANTERRA DENVER

Contract:

Code: Case No.: 52075 SAS No.: SDG No.: 52075

Matrix: (soil/water) WATER Lab Sample ID: 52075-02FD

Sample wt/vol: 4180 (g/ml) ML Lab File ID: A1001158

State: (low/med) LOW Date Received: 10/16/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/16/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 10/25/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND		
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.0	B
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	1.2	_____
86-73-7-----	Fluorene	0.96	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	4.8	B
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GAC-SLP4TFBD

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 52075 SAS No.: SDG No.: 52075

ix: (scil/water) WATER Lab Sample ID: 52075-02FD

le wt/vol: 1051 (g/ml) ML Lab File ID: E3300

l: (low/med) LOW Date Received: 10/16/96

risture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/21/96

centrated Extract Volume: 1.0 (ml) Date Analyzed: 11/05/96

ection Volume: 2.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
108-95-2-----	Phenol	10	U
95-57-8-----	2-Chlorophenol	10	U
95-48-7-----	2-Methylphenol	10	U
106-44-5-----	4-Methylphenol	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2 4-Dimethylphenol	10	U
120-83-2-----	2 4-Dichlorophenol	10	U
59-50-7-----	4-Chloro-3-Methylphenol	10	U
88-06-2-----	2 4 6-Trichlorophenol	10	U
95-95-4-----	2 4 5-Trichlorophenol	24	U
51-28-5-----	2 4-Dinitrophenol	24	U
100-02-7-----	4-Nitrophenol	24	U
534-52-1-----	4 6-Dinitro-2-methylphenol	24	U
87-86-5-----	Pentachlorophenol	24	U

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

2: QUANTERRA DENVER

Contract:

Code:

Case No.: 52075 SAS No.:

SDG No.: 52075

	EPA SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	S7 (2CP) #	S8 (DCB) #	TOT OUT
01	SBLK01	0	0	0	80	70	79	77	0	0
02	LCS	0	0	0	76	69	80	76	0	0
03	GAC-SLP4T	0	0	0	77	67	82	75	0	0
04	GAC-SLP4TD	0	0	0	81	70	84	80	0	0
05	GAC-SLP4TMS	0	0	0	79	72	83	78	0	0
06	GAC-SLP4TMSD	0	0	0	76	70	81	76	0	0
07	GAC-SLP4TFB	0	0	0	79	70	81	77	0	0
08	GAC-SLP4TFBD	0	0	0	78	68	76	76	0	0
09	GAC-SLP4TLE	0	0	0	88	76	83	84	0	0
10	GAC-SLP10T	0	0	0	78	68	78	78	0	0
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		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(35-114)
S2 (FBP)	= 2-Fluorobiphenyl	(43-116)
S3 (TPH)	= Terphenyl-d14	(33-141)
S4 (PHL)	= Phenol-d5	(10-110)
S5 (2FP)	= 2-Fluorophenol	(21-110)
S6 (TBP)	= 2,4,6-Tribromophenol	(10-123)
S7 (2CP)	= 2-Chlorophenol-d4	(33-110) (advisory)
S8 (DCB)	= 1,2-Dichlorobenzene-d4	(16-110) (advisory)

# Column to be used to flag recovery values

\* Values outside of contract required QC limits

## WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 52075

SAS No.:

SDG No.: 52075

Matrix Spike - EPA Sample No.: GAC-SLP4T

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	0.00	8.6	90	20-150
Naphthalene	9.5	0.00	10	105	20-150
Quinoline	9.5	0.00	8.0	84	20-150
2-Methylnaphthalene	9.5	1.8	9.8	84	20-150
Fluorene	9.5	1.0	8.5	79	69-118
Chrysene	9.5	0.00	3.4	36	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC RPD	LIMITS REC.
1H-Indene	9.5	8.5	89	1	20	20-150
Naphthalene	9.5	10	105	0	20	20-150
Quinoline	9.5	8.8	93	10	20	20-150
2-Methylnaphthalene	9.5	9.6	82	2	20	20-150
Fluorene	9.5	8.3	77	2	20	69-118
Chrysene	9.5	3.5	37	3	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 7 outside limits

Spike Recovery: 2 out of 14 outside limits

COMMENTS: \_\_\_\_\_

FORM 3  
WATER SEMIVOLATILE METHOD SPIKE RECOVERY

1 :: QUANTERRA DENVER

Contract:

Code: Case No.: 52075 SAS No.: SDG No.: 52075

.rix Spike - CSLP Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
1H-Indene	10	8.9	89	20-150
Naphthalene	10	10	100	20-150
Quinoline	10	9.4	94	20-150
2-Methylnaphthalene	10	10	100	20-150
Fluorene	10	8.5	85	69-118
Chrysene	10	7.7	77	20-132
Benzo(e)pyrene	10	9.3	93	20-150

: Column to be used to flag recovery and RPD values with an asterisk  
Values outside of QC limits

COMMENTS: \_\_\_\_\_

3C  
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 52075 SAS No.:

SDG No.: 52075

Matrix Spike - EPA Sample No.: GAC-SLP4T

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Phenol	71	0.0	52	73	12-110
2-Chlorophenol	71	0.0	55	77	27-123
4-Chloro-3-Methylphenol	71	0.0	53	75	23- 97
4-Nitrophenol	71	0.0	65	92*	10- 80
Pentachlorophenol	71	0.0	60	84	9-103

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC RPD	LIMITS REC.
Phenol	71	51	72	1	42	12-110
2-Chlorophenol	71	55	77	0	40	27-123
4-Chloro-3-Methylphenol	71	54	76	1	42	23- 97
4-Nitrophenol	71	64	90*	2	50	10- 80
Pentachlorophenol	71	61	86	2	50	9-103

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 5 outside limits

Spike Recovery: 2 out of 10 outside limits

COMMENTS: \_\_\_\_\_

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

b.e: QUANTERRA DENVER

Contract:

' Code: Case No.: 52075 SAS No.: SDG No.: 52075

b File ID: A0101149 Lab Sample ID: SBLK01

Instrument ID: A Date Extracted: 10/16/96

Matrix: (soil/water) WATER Date Analyzed: 10/25/96

Level: (low/med) LOW Time Analyzed: 1602

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	52075-LCS	A0401152	10/25/96
02 GAC-SLP4T	52075-01	A0501153	10/25/96
03 GAC-SLP4TD	52075-01DU	A0601154	10/25/96
04 GAC-SLP4TMS	52075-01MS	A0701155	10/25/96
05 GAC-SLP4TMSD	52075-01MSD	A0801156	10/25/96
06 GAC-SLP4TFB	52075-02FB	A0901157	10/25/96
07 GAC-SLP4TFBD	52075-02FD	A1001158	10/25/96
08 GAC-SLP4TLE	52075-03	A1101159	10/25/96
09 GAC-SLP10T	52075-04	A1201160	10/25/96
10 DP-W401	52075-05	A1301161	10/26/96
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COMMENTS:

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1 of 1

FORM IV SV

OLM03.0

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 52075

SAS No.:

SDG No.: 52075

File ID: E3293

Lab Sample ID: SBLK01

Instrument ID: E

Date Extracted: 10/21/96

Matrix: (soil/water) WATER

Date Analyzed: 11/05/96

Level: (low/med) LOW

Time Analyzed: 1905

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	LCS	E3294	11/05/96
02 GAC-SLP4T	52075-01	E3295	11/05/96
03 GAC-SLP4TD	52075-01DU	E3296	11/05/96
04 GAC-SLP4TMS	52075-01MS	E3297	11/05/96
05 GAC-SLP4TMSD	52075-01SD	E3298	11/05/96
06 GAC-SLP4TFB	52075-02FB	E3299	11/05/96
07 GAC-SLP4TFBD	52075-02FD	E3300	11/05/96
08 GAC-SLP4TLE	52075-03	E3301	11/06/96
09 GAC-SLP10T	52075-04	E3302	11/06/96
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COMMENTS:

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e 1 of 1

FORM IV SV

3/90

RAP SECTION 12.1.1  
ADDITIONAL PAH MONITORING

WELL  
SLP6

WELL	SLP6	SLP6D	SLP6	SLP6	SLP6
DATE	6/4/96	8/27/96	10/28/96	11/18/96	12/16/96
2,3-Benzofuran	0				
2,3-Dihydroindene	53	58	55	74	56
1H-Indene	3.2	7.2	3.5	8.6	3.8
Naphthalene	7.3				
Benzo (b) Thiophene	7	9.7	9.2	12	9.4
1H-Indole					
2-Methylnaphthalene	1.4	1.7		2.9	4.2
1-Methylnaphthalene				1.8	2.3
Biphenyl					
Acenaphthylene	20	15	21	20	26
Acenaphthene	53	48	54	63	59
Dibenzofuran	5.4	4.2	8	7.1	8.6
Fluorene	17	15	24	21	26
Dibenzothiophene		1.1		1.8	1.8
Phenanthrene	7.2	6.1	12	11	15
Anthracene	1		1.4	1.8	1.5
Acridine	3.1	5.6		3.6	2.8
Carbazole		2.4		2.8	
Fluoranthene	1.4	2.6	1.5	3.3	3.9
Pyrene		1.7		3.3	2.4
12-Dimethylbenz(a)anthracene				3.3	1.7
Benzo (e) Pyrene					
Perylene					
3-Methylcholanthrene					
Dibenz (A,C) Anthracene					
Quinoline	C	1.4		1.5	
Benzo (a) Anthracene	C				
Chrysene	C				
Benzo (b) Fluoranthene	C				
Benzo (k) Fluoranthene	C				
Benzo (a) Pyrene	C		0	0	0
Indino (1,2,3-cd) Pyrene	C				
Dibenzo (a,h) Anthracene	C		0	0	0
Benzo (g,h,i) Perylene	C				
<b>TOTAL OTHER PAH</b>		180	178.3	189.6	241.3
<b>BENO(a)PYRENE + DIBENZO(A,H)</b>	C	0	0	0	0
<b>TOTAL CARCINOGEN</b>	C	1.4	0	0	1.5
<b>TOTAL PAH</b>		181.4	178.3	189.6	242.8
Dilution Factor		1	1	1	1
Surrogate Recoveries					
Naphthalene-d8		72	68	102	103
Fluorene-d10		42	77	95	112
Chrysene-d12		72	32	46	37
					22

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303-421-6611 Telephone  
303-431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

September 28, 1996

Quanterra Environmental Services

Project Number 051190

### Introduction

Six aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on August 28, 1996. The samples were logged in under Quanterra Denver's project number 051190. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) total recoverable phenolics.

### Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

Fluorene and benzo (e) pyrene in both the matrix spike and matrix spike duplicate samples were recovered low and outside the acceptance limits stated in the October 1995 QAPP. The LCS and blank associated with these samples were within acceptable limits. A matrix effect is indicated and the data is reportable.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By: Kurt C. III Date: 9/28/91  
Kurt C. III  
Program Manager

Reviewed By: Ellen L. Ruwe Date: 9/28/91

QUALIFIER CODES AND THEIR USAGE

- A = This flag indicates that a TIC is a suspected aldol-condensation product.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.
- C = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, the the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.
- J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

QUALIFIER CODES AND THEIR USAGE  
Page Two

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

S = The concentration of this compound saturated the capacity of the detector and a valid quantitation could not be obtained at this dilution.

U = Indicates compound was analyzed for, but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.

X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".

R = Target compound's secondary ion confirmation not met, however peak shape and retention time make peak identification positive.

ANALYTICAL TEST REQUESTS  
for  
City of St. Louis Park

Lab ID: 051190	Group Code	Analysis Description	Custom Test?
0001 - 0002	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N N
0002	B	Prep - PAH/SIM by GC/MS Low Level Polynuclear Aromatic Hydrocarbons, SIM Low Level	N N

SAMPLE DESCRIPTION INFORMATION  
for  
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Received Time	Received Date
051190-0001-SA	PCJ-SLP6-082796	AQUEOUS	27 AUG 96		28 AUG 96
051190-0001-DU	PCJ-SLP6D-082796	AQUEOUS	27 AUG 96		28 AUG 96
051190-0001-MS	PCJ-SLP6MS-082796	AQUEOUS	27 AUG 96		28 AUG 96
051190-0001-SD	PCJ-SLP6MSD-082796	AQUEOUS	27 AUG 96		28 AUG 96
051190-0002-FB	PCJ-SLP6FB-082796	AQUEOUS	27 AUG 96		28 AUG 96
051190-0002-FD	PCJ-SLP6FBD-082796	AQUEOUS	27 AUG 96		28 AUG 96



# Chain of Custody Record

Environmental  
Services

OUA-4124-1

Client

City of St. Louis Park  
3752 Wooddale Ave So  
St. Louis Park Mn. 55416

Project Manager

SCOTT ANDERSON

Telephone Number (Area Code)/Fax Number

924-2557 (612) 924-2570

Date

8-27-96

Chain Of Custody Number

69598

Address

City

Project Name

SAME

Contract/Purchase Order/Quote No.

Site Contact

Lab Contact

Analysis (Attach list if  
more space is needed)

Page 1 of 3

Carrier/Waybill Number

FED EX 7818345582

Special Instructions/  
Conditions of Receipt

Matrix

Containers &  
Preservatives

Sample I.D. No. and Description

(Containers for each sample may be combined on one line)

Date

Time

Agg

Sec

Soil

Impres.

H2SO4

HNO3

HCl

NaOH

ZnAc

NaOH

PCJ-5LP6-082796

8-27-96

X

PCJ-5LP6D-082796

8-27-96

X

X

PPT

PET

-01

PPT

PPE 5

PPT 5

Possible Hazard Identification

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Sample Disposal

Return To Client

Disposal By Lab

Archive For

Months longer than 3 months) (A fee may be assessed if samples are retained)

Turn Around Time Required

24 Hours  48 Hours  7 Days  14 Days  21 Days  Other \_\_\_\_\_

Date

Time

8-27-96

1. Received By

\_\_\_\_\_  
PCC

Date

Time

8/28/96

Date

Time

2. Received By

\_\_\_\_\_  
PCC

Date

Time

3. Received By

\_\_\_\_\_  
PCC

Date

Time

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy



13  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Name: QUANTERRA DENVER

Contract:

SLP6

Code:	Case No.: 51190	SAS No.:	SDG No.: 51190
Ex: (soil/water) WATER		Lab Sample ID:	51190-01
Sample wt/vol:	4200 (g/ml) ML	Lab File ID:	A0301813
Level: (low/med)	LOW	Date Received:	08/28/96
Distilled:	decanted: (Y/N)	Date Extracted:	09/03/96
Extracted Extract Volume:	0.5 (ml)	Date Analyzed:	09/11/96
Reaction Volume:	1.0 (uL)	Dilution Factor:	1.0
Cleanup:	(Y/N) N	pH:	7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	U
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	48	_____
95-13-6-----	1H-Indene	6.0	_____
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	7.8	_____
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	1.1	_____
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	12	_____
83-32-9-----	Acenaphthene	38	_____
132-64-9-----	Dibenzofuran	3.2	_____
86-73-7-----	Fluorene	12	R
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	4.9	_____
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	4.2	_____
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.7	_____
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

13  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SLP6D

Name: QUANTERRA DENVER

Contract:

SDG No.: 51190

Sample: (soil/water) WATER

Lab Sample ID: 51190-01DU

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: A0401814

Sample: (low/med) LOW

Date Received: 08/28/96

Sample: decanted: (Y/N) \_\_\_\_\_

Date Extracted: 09/03/96

Extracted Extract Volume: 0.5 (ml)

Date Analyzed: 09/11/96

Dilution Volume: 1.0 (uL)

Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND	UNITS: (ug/L or ug/Kg)	NG/L	Q
---------	----------	---------------------------	------	---

271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	58	_____
95-13-6-----	1H-Indene	7.2	_____
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	9.7	_____
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	1.7	_____
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	15	_____
83-32-9-----	Acenaphthene	48	_____
132-64-9-----	Dibenzofuran	4.2	_____
86-73-7-----	Fluorene	15	R
132-65-0-----	Dibenzothiophene	1.1	_____
85-01-8-----	Phenanthrene	6.1	_____
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	5.6	_____
86-74-8-----	Carbazole	2.4	_____
206-44-0-----	Fluoranthene	2.6	_____
129-00-0-----	Pyrene	1.7	_____
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

13  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Name: QUANTERRA DENVER

Contract:

SLP6FB

Date: Case No.: 51190 SAS No.: SDG No.: 51190  
 : (scil/water) WATER Lab Sample ID: 51190-02FB  
 : wt/vol: 4180 (g/ml) ML Lab File ID: A0701817  
 : (low/med) LOW Date Received: 08/28/96  
 sture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 09/03/96  
 ntrated Extract Volume: 0.5 (ml) Date Analyzed: 09/11/96  
 cision Volume: 1.0 (uL) Dilution Factor: 1.0  
 leanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	1.3 U
95-13-6-----	1H-Indene	0.86 U
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	1.2 U
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	0.96 U
86-73-7-----	Fluorene	0.96 U
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	1.5 U
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.3 U
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

13  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

SLP6F3D

Name: QUANTERRA DENVER

Contract:

Code: Case No.: S1190 SAS No.: SDG No.: S1190  
 Matrix: (soil/water) WATER Lab Sample ID: S1190-02FD  
 Soln wt/vol: 4190 (g/ml) ML Lab File ID: A1401847  
 Soln: (low/med) LOW Date Received: 08/28/96  
 Distilled: \_\_\_\_\_ Date Extracted: 09/03/96  
 Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 09/13/96  
 Fraction Volume: 1.0 (uL) Dilution Factor: 1.0  
 Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
 CAS NO. COMPOUND (ug/L or ug/Kg) NG/L Q

271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	7.8	U
95-15-8-----	Benzo(b)thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	1.8	U
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	0.95	U
86-73-7-----	Fluorene	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	1.7	U
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)Fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

ame: QUANTERRA DENVER

**Contract:**

:de: . Case No.: 51190 SAS No.:

SDG No.: 51190

S<sub>1</sub> = Naphthalene-d<sub>8</sub> (21-108)  
 S<sub>2</sub> = Chrysene-d<sub>12</sub> (10-118)  
 S<sub>3</sub> = Fluorene-d<sub>10</sub> (41-162)

# Column to be used to flag recovery values  
\* Values outside of contract required QC limits  
D Surrogate diluted out

Page 1 CE 1

FORM II SV-1

3/50

## LITER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 51190

SAS No.:

SDG No.: 51190

Matrix Spike - EPA Sample No.: SLP6

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	6.0	10	42	20-150
Naphthalene	9.5	0.00	7.4	78	20-150
Quinoline	9.5	0.00	5.4	57	20-150
2-Methylnaphthalene	9.5	1.1	6.8	60	20-150
Fluorene	9.5	12	18	63*	69-118
Chrysene	9.5	0.00	2.6	27	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1H-Indene	9.5	12	63	40*	20	20-150
Naphthalene	9.5	8.5	89	13	20	20-150
Quinoline	9.5	5.2	55	4	20	20-150
2-Methylnaphthalene	9.5	7.8	70	15	20	20-150
Fluorene	9.5	22	105	50*	20	69-118
Chrysene	9.5	3.1	33	20	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

Column to be used to flag recovery and RPD values with an asterisk  
 Values outside of QC limits

D: 2 out of 7 outside limits  
 Spike Recovery: 3 out of 14 outside limits

COMMENTS: \_\_\_\_\_

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Name: QUANTERRA DENVER	Contract:	SLP6MS
Code: Case No.: 51190	SAS No.:	SDG No.: 51190
ix: (soil/water) WATER	Lab Sample ID: 51190-01MS	
le wt/vcl: 4200 (g/mL) ML	Lab File ID: A1101821	
el: (low/med) LOW	Date Received: 08/28/96	
isture: _____ decanted: (Y/N) _____	Date Extracted: 09/03/96	
centrated Extract Volume: 0.5 (mL)	Date Analyzed: 09/11/96	
ction Volume: 1.0 (uL)	Dilution Factor: 1.0	
Cleanup: (Y/N) N	pH: 7.0	

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	
271-89-6-----	2,3-Benzofuran_____	4.8	U
496-11-7-----	2,3-Dihydroindene_____	46	_____
95-13-6-----	1E-Indene_____	10	_____
91-20-3-----	Naphthalene_____	7.4	_____
95-15-8-----	Benzo(b)thiophene_____	7.2	_____
91-22-5-----	Quinoline_____	5.4	_____
120-72-9-----	1E-Indole_____	2.4	U
91-57-6-----	2-Methylnaphthalene_____	6.8	_____
90-12-0-----	1-Methylnaphthalene_____	1.5	U
92-52-4-----	Biphenyl_____	4.1	U
208-96-8-----	Acenaphthylene_____	11	_____
83-32-9-----	Acenaphthene_____	38	_____
132-64-9-----	Dibenzofuran_____	3.2	_____
86-73-7-----	Fluorene_____	18	R
132-65-0-----	Dibenzothiophene_____	1.0	U
85-01-8-----	Phanthrene_____	5.1	_____
120-12-7-----	Anthracene_____	1.0	U
260-94-6-----	Acridine_____	4.3	_____
86-74-8-----	Carbazole_____	2.3	_____
206-44-0-----	Fluoranthene_____	2.4	_____
129-00-0-----	Pyrene_____	1.8	_____
56-55-3-----	Benzo(a)Anthracene_____	2.4	U
218-01-9-----	Chrysene_____	2.6	J
207-08-9-----	Benzo(b)fluoranthene_____	2.4	U
205-08-9-----	Benzo(k)fluoranthene_____	2.2	U
192-97-2-----	Benzo(e)pyrene_____	1.8	U
50-32-8-----	Benzo(a)pyrene_____	2.2	U
198-55-0-----	Perylene_____	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene_____	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene_____	1.5	U
191-24-2-----	Benzo(g,h,i)perylene_____	2.7	U

13  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Name: QUANTERRA DENVER

Contract:

SLP6MSD

Sample: (soil/water) WATER Lab Sample ID: 51190-01MSD  
 Sample wt/vol: 4200 (g/ml) ML Lab File ID: A1201822  
 Sample: (low/med) LOW Date Received: 08/28/96  
 Sample: decanted: (Y/N) Date Extracted: 09/03/96  
 Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 09/11/96  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.8 U
496-11-7-----	2,3-Dihydroindene	52
95-13-6-----	1H-Indene	12
91-20-3-----	Naphthalene	8.5
95-15-8-----	Benzo(b)thiophene	8.0
91-22-5-----	Quinoline	5.2
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	7.8
90-12-0-----	1-Methylnaphthalene	1.5 U
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	14
83-32-9-----	Acenaphthene	44
132-64-9-----	Dibenzofuran	3.7
86-73-7-----	Fluorane	22 R
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	5.8
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	5.6
86-74-8-----	Carbazole	2.8
206-44-0-----	Fluoranthene	2.1
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	3.1
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrane	2.0 U
53-70-3-----	Dibenz(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

FORM 3  
WATER SEMIVOLATILE METHOD SPIKE RECOVERY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 51190

SAS No.:

SDG No.: 51190

ix Spike - Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
1-Indene	10	7.0	70	20-150
Phthalene	10	8.4	84	20-150
Linoline	10	6.6	66	20-150
Methylnaphthalene	10	9.6	96	20-150
Luorene	10	8.6	86	69-118
rysene	10	7.5	75	20-132
enzo(e)pyrene	10	9.9	99	20-150

Column to be used to flag recovery and RPD values with an asterisk  
Values outside of QC limits

MENTS: \_\_\_\_\_

Name: QUANTERRA DENVER

Contract:

LCS

Date: Case No.: 51190 SAS No.: SDG No.: 51190

Medium: (scil/water) WATER Lab Sample ID: 51190-LCS

Sample wt/vol: 4000 (g/ml) ML Lab File ID: A0201812

Concen. (low/med) LOW Date Received: \_\_\_\_\_

Storage: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 09/03/96

Conc. Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 09/11/96

Conc. Dilution Volume: 1.0 (uL) Dilution Factor: 1.0

Conc. Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
95-13-6-----	1H-Indene _____	7.0	_____
91-20-3-----	Naphthalene _____	8.4	_____
91-22-5-----	Quinoline _____	6.6	_____
91-57-6-----	2-Methylnaphthalene _____	9.6	_____
86-73-7-----	Fluorene _____	8.6	_____
218-01-9-----	Chrysene _____	7.5	_____
192-97-2-----	Benzo(e)pyrene _____	9.9	_____

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01
--------

b Name: QUANTERRA DENVER Contract:

b Code: Case No.: 51190 SAS No.: SDG No.: 51190

b File ID: A0101811 Lab Sample ID: SBLK01

Instrument ID: A Date Extracted: 09/03/96

Matrix: (soil/water) WATER Date Analyzed: 09/11/96

Level: (low/med) LOW Time Analyzed: 1222

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	51190-LCS	A0201812	09/11/96
02 SLP6	51190-01	A0301813	09/11/96
03 SLP6D	51190-01DU	A0401814	09/11/96
04 SLP6FB	51190-02FB	A0701817	09/11/96
05 SLP6MS	51190-01MS	A1101821	09/11/96
06 SLP6MSD	51190-01MSD	A1201822	09/11/96
07 SLP6FBD	51190-02FD	A1401847	09/13/96
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30			

COMMENTS:

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13  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER	Contract:	SBLK01
Lab Code: Case No.: 51190	SAS No.:	SDG No.: 51190
Matrix: (soil/water) WATER	Lab Sample ID: SBLK01	
Sample wt/vol: 4000 (g/ml) ML	Lab File ID: A0101811	
Level: (low/med) LOW	Date Received: _____	
Moisture: _____ decanted: (Y/N) _____	Date Extracted: 09/03/96	
Concentrated Extract Volume: 0.5 (ml)	Date Analyzed: 09/11/96	
Injection Volume: 1.0 (uL)	Dilution Factor: 1.0	
HPLC Cleanup: (Y/N) N	pH: 7.0	

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran_____	5.1	U	
496-11-7-----	2,3-Dihydroindene_____	1.4	U	
95-13-6-----	1H-Indene_____	0.90	U	
91-20-3-----	Naphthalene_____	6.5	U	
95-15-8-----	Benzo(b)thiophene_____	0.90	U	
91-22-5-----	Quinoline_____	1.4	U	
120-72-9-----	1H-Indole_____	2.5	U	
91-57-6-----	2-Methylnaphthalene_____	0.90	U	
90-12-0-----	1-Methylnaphthalene_____	1.6	U	
92-52-4-----	Biphenyl_____	4.3	U	
208-96-8-----	Acenaphthylene_____	1.4	U	
83-32-9-----	Acenaphthene_____	1.3	U	
132-64-9-----	Dibenzofuran_____	1.0	U	
86-73-7-----	Fluorane_____	1.0	U	
132-65-0-----	Dibenzothiophene_____	1.1	U	
85-01-8-----	Phenanthrene_____	1.3	U	
120-12-7-----	Anthracene_____	1.1	U	
260-94-6-----	Acridine_____	2.9	U	
86-74-8-----	Carbazole_____	1.9	U	
206-44-0-----	Fluoranthene_____	1.4	U	
129-00-0-----	Pyrene_____	1.4	U	
56-55-3-----	Benzo(a)Anthracene_____	2.5	U	
218-01-9-----	Chrysene_____	2.8	U	
207-08-9-----	Benzo(b)fluoranthene_____	2.5	U	
205-08-9-----	Benzo(k)fluoranthene_____	2.3	U	
192-97-2-----	Benzo(e)pyrene_____	1.9	U	
50-32-8-----	Benzo(a)pyrene_____	2.3	U	
198-55-0-----	Perylene_____	2.5	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene_____	2.1	U	
53-70-3-----	Dibenzo(a,h)anthracene_____	1.6	U	
191-24-2-----	Benzo(g,h,i)perylene_____	2.8	U	

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Re: QUANTERRA DENVER

**Contract:**

de: Case No.: 51190

SAS No.:

SDG No.: 51190

le ID (Standard) : A810

Date Analyzed: 09/11/96

ment ID: A

Time Analyzed: 1008

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

1 of 1

FORM VIII SV-1

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8B  
SEMICVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 51190

SAS No.:

SDG No.: 51190

Lab File ID (Standard): A1301846

Date Analyzed: 09/13/96

Instrument ID: A

Time Analyzed: 1646

	IS1(ANT) AREA #	RT #	IS2(PEN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	144771	12.64	199345	15.12	72597	21.71
UPPER LIMIT	289542	13.14	398690	15.62	145194	22.21
LOWER LIMIT	72386	12.14	99672	14.62	36298	21.21
EPA SAMPLE NO.						
01 SLP6FED	184134	12.64	267979	15.12	91936	21.71
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
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14						
15						
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18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10

IS2 (PEN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303-421-6611 Telephone  
303-431-7171 Fax

**CASE NARRATIVE**

**FOR**

**City of St. Louis Park**

**December 9, 1996**

**Quanterra Environmental Services**

**Project Number 052325**

**Introduction**

Six aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on October 29, 1996. The samples were logged in under Quanterra Denver's project number 052325. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

**Data Quality Assessment**

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

The surrogate naphthalene-d8 is reported outside the control limits (21%  $\pm$  108%) in the LCS at 109% and sample 052325-00FD at 112%. All the surrogates for the method blank and the remaining samples were recovered within acceptable limits.

Benzo (e) pyrene was not recovered in the matrix spike or matrix spike duplicate samples. Benzo (e) pyrene was recovered in the LCS and method blank within the accepted limits. Matrix effect is indicated.

Fluorene was recovered low in both the matrix spike and matrix spike duplicate samples. The level spiked into the samples was insufficient relative to the amount present in the samples (9.5 ng/L spike level, 24 and 27 ng/L present in the samples). As a result of the low recoveries, the relative percent difference (RPD) for this compound is reported outside of QC limits.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By: Kurt C. III Date: 12/9/96  
Kurt C. III  
Program Manager

Reviewed By: John J. Rivelle Date: 12/9/96

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6

☐ Name: QUANTERRA DENVER Contract:  
 ☐ Case No.: 52325 SAS No.: SDG No.: 52325  
 ☐ Matrix: (soil/water) WATER Lab Sample ID: 52325-02  
 ☐ Sample wt/vol: 4200 (g/ml) ML Lab File ID: A1201255  
 ☐ Soln: (low/med) LOW Date Received: 10/29/96  
 ☐ Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/29/96  
 ☐ Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 11/08/96  
 ☐ Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 ☐ QC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	55	_____
95-13-6-----	1H-Indene	3.5	_____
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	9.2	_____
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	0.86	U
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	21	_____
83-32-9-----	Acenaphthene	54	_____
132-64-9-----	Dibenzofuran	8.0	_____
86-73-7-----	Fluorene	24	_____
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	12	B
120-12-7-----	Anthracene	1.4	_____
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.5	_____
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6D

b Name: QUANTERRA DENVER Contract:

b Code: Case No.: 52325 SAS No.: SDG No.: 52325

atrix: (soil/water) WATER Lab Sample ID: 52325-02DU

mple wt/vol: 4200 (g/ml) ML Lab File ID: A1301256

level: (low/med) LOW Date Received: 10/29/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/29/96

ncentrated Extract Volume: 0.5(ml) Date Analyzed: 11/08/96

jection Volume: 1.0(uL) Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran_____	4.8	U
496-11-7-----	2,3-Dihydroindene_____	53	_____
95-13-6-----	1H-Indene_____	3.5	_____
91-20-3-----	Naphthalene_____	6.2	U
95-15-8-----	Benzo(b)thiophene_____	8.4	_____
91-22-5-----	Quinoline_____	1.3	U
120-72-9-----	1H-Indole_____	2.4	U
91-57-6-----	2-Methylnaphthalene_____	0.86	U
90-12-0-----	1-Methylnaphthalene_____	1.5	U
92-52-4-----	Biphenyl_____	4.1	U
208-96-8-----	Acenaphthylene_____	20	_____
83-32-9-----	Acenaphthene_____	50	_____
132-64-9-----	Dibenzofuran_____	7.6	_____
86-73-7-----	Fluorene_____	22	_____
132-65-0-----	Dibenzothiophene_____	1.0	U
85-01-8-----	Phenanthrene_____	10	B
120-12-7-----	Anthracene_____	1.2	_____
260-94-6-----	Acridine_____	2.8	U
86-74-8-----	Carbazole_____	1.8	U
206-44-0-----	Fluoranthene_____	1.4	_____
129-00-0-----	Pyrene_____	1.3	U
56-55-3-----	Benzo(a)Anthracene_____	2.4	U
218-01-9-----	Chrysene_____	2.7	U
207-08-9-----	Benzo(b)Fluoranthene_____	2.4	U
205-08-9-----	Benzo(k)fluoranthene_____	2.2	U
192-97-2-----	Benzo(e)pyrene_____	1.8	U
50-32-8-----	Benzo(a)pyrene_____	2.2	U
198-55-0-----	Perylene_____	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene_____	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene_____	1.5	U
191-24-2-----	Benzo(g,h,i)perylene_____	2.7	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6FB

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 52325 SAS No.: SDG No.: 52325

Matrix: (soil/water) WATER Lab Sample ID: 52325-01FB

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A1001253

Level: (low/med) LOW Date Received: 10/29/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 10/29/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 11/08/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U	
496-11-7-----	2,3-Dihydroindene	1.3	U	
95-13-6-----	1H-Indene	0.86	U	
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	0.86	U	
90-12-0-----	1-Methylnaphthalene	1.5	U	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	0.95	U	
86-73-7-----	Fluorene	1.0	U	
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	3.7	B	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	1.3	U	
129-00-0-----	Pyrene	1.3	U	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6FBD

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 52325 SAS No.: SIDG No.: 52325

Matrix: (soil/water) WATER Lab Sample ID: 52325-01FD

Sample wt/vol: 4190 (g/ml) ML Lab File ID: A1101254

Level: (low/med) LOW Date Received: 10/29/96

% Moisture: \_\_\_\_\_ Date Extracted: 10/29/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 11/08/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	4.9	U
496-11-7-----	2,3-Dihydroindene	1.3	U
95-13-6-----	1H-Indene	0.86	U
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b) thiophene	0.86	U
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	1.5	U
90-12-0-----	1-Methylnaphthalene	1.5	U
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	1.3	U
83-32-9-----	Acenaphthene	1.2	U
132-64-9-----	Dibenzofuran	1.3	U
86-73-7-----	Fluorene	0.95	U
132-65-0-----	Dibenzothiophene	1.0	U
85-01-8-----	Phenanthrene	4.1	S
120-12-7-----	Anthracene	1.0	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.3	U
129-00-0-----	Pyrene	1.3	U
56-55-3-----	Benzo(a) Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b) fluoranthene	2.4	U
205-08-9-----	Benzo(k) fluoranthene	2.2	U
192-97-2-----	Benzo(e) pyrene	1.8	U
50-32-8-----	Benzo(a) pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd) pyrene	2.0	U
53-70-3-----	Dibenzo(a,h) anthracene	1.5	U
191-24-2-----	Benzo(g,h,i) perylene	2.7	U

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 52325 SAS No.:

SDG No.: 52325

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
1	SBLK01	100	114	95						0
2	LCS	109*	113	101						1
3	PCJ-SLP6FB	87	108	85						0
4	PCJ-SLP6FBD	112*	118	106						1
5	PCJ-SLP6	102	46	95						0
6	PCJ-SLP6D	92	46	92						0
7	PCJ-SLP6MS	93	44	90						0
8	PCJ-SLP6MSD	91	42	85						0
9										
10										
11										
12										
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QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

## WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 52325 SAS No.:

SDG No.: 52325

Matrix Spike - EPA Sample No.: PCJ-SLP6

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	3.5	10	68	20-150
Naphthalene	9.5	0.00	9.3	98	20-150
Quinoline	9.5	0.00	9.0	95	20-150
2-Methylnaphthalene	9.5	0.00	8.5	89	20-150
Fluorene	9.5	.24	29	53*	69-118
Chrysene	9.5	0.00	3.8	40	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMTS RPD	REC.
1H-Indene	9.5	10	68	0	20	20-150
Naphthalene	9.5	9.4	99	1	20	20-150
Quinoline	9.5	8.6	90	5	20	20-150
2-Methylnaphthalene	9.5	8.5	89	0	20	20-150
Fluorene	9.5	.27	32*	49*	20	69-118
Chrysene	9.5	3.6	38	5	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 1 out of 7 outside limits

Spike Recovery: 4 out of 14 outside limits

COMMENTS: \_\_\_\_\_

FORM 3  
WATER SEMIVOLATILE METHOD SPIKE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 52325

SAS No.:

SDG No.: 52325

Matrix Spike - Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
1H-Indene	10	8.4	84	20-150
Naphthalene	10	9.8	98	20-150
Quinoline	10	9.9	99	20-150
2-Methylnaphthalene	10	9.5	95	20-150
Fluorene	10	9.9	99	69-118
Chrysene	10	10	100	20-132
Benzo(e)pyrene	10	9.4	94	20-150

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

COMMENTS: \_\_\_\_\_

4B  
SEMITVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

SBLK01

Lab Code:

Case No.: 52325

SAS No.:

SDG No.: 52325

Lab File ID: A0801251

Lab Sample ID: SBLK01

Instrument ID: A

Date Extracted: 10/29/96

Matrix: (soil/water) WATER

Date Analyzed: 11/08/96

Level: (low/med) LOW

Time Analyzed: 1456

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	52325-LCS	A0901252	11/08/96
02 PCJ-SLP6FB	52325-01FB	A1001253	11/08/96
03 PCJ-SLP6FBD	52325-01FD	A1101254	11/08/96
04 PCJ-SLP6	52325-02	A1201255	11/08/96
05 PCJ-SLP6D	52325-02DU	A1301256	11/08/96
06 PCJ-SLP6MS	52325-02MS	A1401257	11/08/96
07 PCJ-SLP6MSD	52325-02MSD	A1501258	11/08/96
08			
09			
10			
11			
12			
13			
14			
15			
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27			
28			
29			
30			

COMMENTS:

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8B  
SEMVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

I Code:

Case No.: 52325

SAS No.:

SDG No.: 52325

Lab File ID (Standard): A243

Date Analyzed: 11/08/96

Instrument ID: A

Time Analyzed: 0936

	IS1 (ANT) AREA #	RT #	IS2 (PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	199984	12.13	300746	14.53	175860	21.15
UPPER LIMIT	399968	12.63	601492	15.03	351720	21.65
LOWER LIMIT	99992	11.63	150373	14.03	87930	20.65
EPA SAMPLE NO.						
01 SBLK01	176361	12.11	260429	14.52	103736	21.13
02 LCS	167577	12.11	252981	14.52	108060	21.13
03 PCJ-SLP6FB	165761	12.11	248961	14.52	110741	21.13
04 PCJ-SLP6FBD	179112	12.11	272612	14.51	116168	21.12
05 PCJ-SLP6	186270	12.11	271697	14.52	137726	21.13
06 PCJ-SLP6D	192640	12.12	286880	14.51	134590	21.13
07 PCJ-SLP6MS	190553	12.12	272957	14.51	133674	21.13
08 PCJ-SLP6MSD	187412	12.12	259940	14.52	132954	21.13
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

: 1 of 1

FORM VIII SV-1

OLM03.0

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

me : QUANTERRA DENVER

**Contract:**

de:

Case No.: 52325 SAS No.:

SDG No.: 52325

S1 = Naphthalene-d<sub>8</sub>  
 S2 = Chrysene-d<sub>12</sub>  
 S3 = Fluorene-d<sub>10</sub>

## QC LIMITS

(21-108)

(10-118)

(41-162)

# Column to be used to flag recovery values  
\* Values outside of contract required QC limits  
D Surrogate diluted out

## WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 52325

SAS No.:

SDG No.: 52325

Matrix Spike - EPA Sample No.: PCJ-SLP6

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	3.5	10	68	20-150
Naphthalene	9.5	0.00	9.3	98	20-150
Quinoline	9.5	0.00	9.0	95	20-150
2-Methylnaphthalene	9.5	0.00	8.5	89	20-150
Fluorene	9.5	24	29	53*	69-118
Chrysene	9.5	0.00	3.8	40	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMITS RPD	REC.
1H-Indene	9.5	10	68	0	20	20-150
Naphthalene	9.5	9.4	99	1	20	20-150
Quinoline	9.5	8.6	90	5	20	20-150
2-Methylnaphthalene	9.5	8.5	89	0	20	20-150
Fluorene	9.5	27	32*	49*	20	69-118
Chrysene	9.5	3.6	38	5	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 1 out of 7 outside limits

Spike Recovery: 4 out of 14 outside limits

COMMENTS: \_\_\_\_\_

**FORM 3**  
**WATER SEMIVOLATILE METHOD SPIKE RECOVERY**

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 52325

SAS No.:

SDG No.: 52325

Matrix Spike - Sample No.: LCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ng/L)	% REC #	QC. LIMITS REC.
1H-Indene	10	8.4	84	20-150
Naphthalene	10	9.8	98	20-150
Quinoline	10	9.9	99	20-150
2-Methylnaphthalene	10	9.5	95	20-150
Fluorene	10	9.9	99	69-118
Chrysene	10	10	100	20-132
Benzo(e)pyrene	10	9.4	94	20-150

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

COMMENTS: \_\_\_\_\_

4B  
SEMOVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 52325 SAS No.: SDG No.: 52325

File ID: A0801251 Lab Sample ID: SBLK01

Instrument ID: A Date Extracted: 10/29/96

Matrix: (soil/water) WATER Date Analyzed: 11/08/96

Level: (low/med) LOW Time Analyzed: 1456

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	52325-LCS	A0901252	11/08/96
02 PCJ-SLP6FB	52325-01FB	A1001253	11/08/96
03 PCJ-SLP6FBD	52325-01FD	A1101254	11/08/96
04 PCJ-SLP6	52325-02	A1201255	11/08/96
05 PCJ-SLP6D	52325-02DU	A1301256	11/08/96
06 PCJ-SLP6MS	52325-02MS	A1401257	11/08/96
07 PCJ-SLP6MSD	52325-02MSD	A1501258	11/08/96
08			
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30			

COMMENTS:

1 of 1

FORM IV SV

OLM03.0

8B  
SEMOVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 52325

SAS No.:

SDG No.: 52325

Lab File ID (Standard): A243

Date Analyzed: 11/08/96

Instrument ID: A

Time Analyzed: 0936

	IS1 (ANT) AREA #	RT #	IS2 (PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	199984	12.13	300746	14.53	175860	21.15
UPPER LIMIT	399968	12.63	601492	15.03	351720	21.65
LOWER LIMIT	99992	11.63	150373	14.03	87930	20.65
EPA SAMPLE NO.						
01 SBLK01	176361	12.11	260429	14.52	103736	21.13
02 LCS	167577	12.11	252981	14.52	108060	21.13
03 PCJ-SLP6FB	165761	12.11	248961	14.52	110741	21.13
04 PCJ-SLP6FBD	179112	12.11	272612	14.51	116168	21.12
05 PCJ-SLP6	186270	12.11	271697	14.52	137726	21.13
06 PCJ-SLP6D	192640	12.12	286880	14.51	134590	21.13
07 PCJ-SLP6MS	190553	12.12	272957	14.51	133674	21.13
08 PCJ-SLP6MSD	187412	12.12	259940	14.52	132954	21.13
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303 421-6611 Telephone  
303 431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

December 23, 1996

Quanterra Environmental Services

Project Number 052656

### Introduction

Six aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on November 18, 1996. The samples were logged in under Quanterra Denver's project number 052656. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

### Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

The surrogate naphthalene-d8 was recovered at 110% in the LCS and 116% in the method blank which are outside the 21% to 108% acceptance criteria. Naphthalene-d8 was recovered within acceptance limits in all associated samples. Naphthalene was not detected in any of the samples above the reporting limit.

The spike compound benzo (e) pyrene was not recovered in either the matrix spike or matrix spike duplicate samples. Benzo (e) pyrene was recovered within acceptance limits in the LCS. A matrix effect is indicated.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By:

Kurt C. Ill

Date:

12/23/95

Kurt C. Ill  
Program Manager

Reviewed By:

Allen J. Ruwe

Date:

12/23/95

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

PCJ-SLP6

Code:	Case No.: 52656	SAS No.:	SDG No.: 52656
Matrix: (soil/water)	WATER	Lab Sample ID:	52656-01
Sample wt/vol:	4200 (g/ml) ML	Lab File ID:	A0301319
Level: (low/med)	LOW	Date Received:	11/19/96
% Moisture:	_____	Date Extracted:	11/20/96
Concentrated Extract Volume:	0.5 (ml)	Date Analyzed:	12/06/96
Injection Volume:	1.0 (uL)	Dilution Factor:	1.0
GPC Cleanup: (Y/N)	N	pH:	7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U	
496-11-7-----	2,3-Dihydroindene	74		
95-13-6-----	1H-Indene	8.6		
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	12		
91-22-5-----	Quinoline	1.5		
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	2.9	B	
90-12-0-----	1-Methylnaphthalene	1.8	R	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	20		
83-32-9-----	Acenaphthene	63		
132-64-9-----	Dibenzofuran	7.1	B	
86-73-7-----	Fluorene	21		
132-65-0-----	Dibenzothiophene	1.8		
85-01-8-----	Phenanthrene	11	B	
120-12-7-----	Anthracene	1.8		
260-94-6-----	Acridine	3.6		
86-74-8-----	Carbazole	2.8		
206-44-0-----	Fluoranthene	3.3	B	
129-00-0-----	Pyrene	3.3	B	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6D

☐ Name: QUANTERRA DENVER                      Contract: \_\_\_\_\_  
 ☐ Code:                      Case No.: 52656      SAS No.:                      SDG No.: 52656  
 ☐ trix: (soil/water) WATER                      Lab Sample ID: 52656-01DU  
 ☐ mple wt/vol: 4200 (g/ml) ML                      Lab File ID: A0401311  
 ☐ vel: (low/med) LOW                              Date Received: 11/19/96  
 ☐ Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_                      Date Extracted: 11/20/96  
 ☐ ncentrated Extract Volume: 0.5(ml)                      Date Analyzed: 12/04/96  
 ☐ ijection Volume: 1.0 (uL)                              Dilution Factor: 1.0  
 ☐ C Cleanup: (Y/N) N                      pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U	
496-11-7-----	2,3-Dihydroindene	72		
95-13-6-----	1H-Indene	8.6		
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	12		
91-22-5-----	Quinoline	1.5		
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	3.7	B	
90-12-0-----	1-Methylnaphthalene	2.1	R	
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	20		
83-32-9-----	Acenaphthene	62		
132-64-9-----	Dibenzofuran	7.2	B	
86-73-7-----	Fluorene	21		
132-65-0-----	Dibenzothiophene	1.9		
85-01-8-----	Phenanthrene	14	B	
120-12-7-----	Anthracene	2.1		
260-94-6-----	Acridine	4.4		
86-74-8-----	Carbazole	3.0		
206-44-0-----	Fluoranthene	4.3	B	
129-00-0-----	Pyrene	2.9	B	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6FB

Name: QUANTERRA DENVER

Contract:

Date: Case No.: 52656 SAS No.: SDG No.: 52656

Matrix: (soil/water) WATER Lab Sample ID: 52656-02FB

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0701314

Level: (low/med) LOW Date Received: 11/19/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 11/20/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 12/04/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.8 U
496-11-7-----	2,3-Dihydroindene	1.4 _____
95-13-6-----	1H-Indene	1.1 _____
91-20-3-----	Naphthalene	6.2 U
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.8 _____
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	4.2 B
90-12-0-----	1-Methylnaphthalene	2.1 _____
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	1.7 B
86-73-7-----	Fluorene	2.0 _____
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	7.8 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	2.4 B
129-00-0-----	Pyrene	1.8 B
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6FBD

a Name: QUANTERRA DENVER Contract:

b Code: Case No.: 52656 SAS No.: SDG No.: 52656

matrix: (soil/water) WATER Lab Sample ID: 52656-02FD

sample wt/vol: 4200 (g/ml) ML Lab File ID: A0801315

level: (low/med) LOW Date Received: 11/19/96

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 11/20/96

Concentrated Extract Volume: 0.5 (ml) Date Analyzed: 12/04/96

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

PC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U	
496-11-7-----	2,3-Dihydroindene	1.5		
95-13-6-----	1H-Indene	1.0		
91-20-3-----	Naphthalene	6.2	U	
95-15-8-----	Benzo(b)thiophene	0.86	U	
91-22-5-----	Quinoline	1.3	U	
120-72-9-----	1H-Indole	2.4	U	
91-57-6-----	2-Methylnaphthalene	3.8	B	
90-12-0-----	1-Methylnaphthalene	1.9		
92-52-4-----	Biphenyl	4.1	U	
208-96-8-----	Acenaphthylene	1.3	U	
83-32-9-----	Acenaphthene	1.2	U	
132-64-9-----	Dibenzofuran	1.4	B	
86-73-7-----	Fluorene	1.6		
132-65-0-----	Dibenzothiophene	1.0	U	
85-01-8-----	Phenanthrene	6.9	B	
120-12-7-----	Anthracene	1.0	U	
260-94-6-----	Acridine	2.8	U	
86-74-8-----	Carbazole	1.8	U	
206-44-0-----	Fluoranthene	2.2	B	
129-00-0-----	Pyrene	1.8	B	
56-55-3-----	Benzo(a)Anthracene	2.4	U	
218-01-9-----	Chrysene	2.7	U	
207-08-9-----	Benzo(b)fluoranthene	2.4	U	
205-08-9-----	Benzo(k)fluoranthene	2.2	U	
192-97-2-----	Benzo(e)pyrene	1.8	U	
50-32-8-----	Benzo(a)pyrene	2.2	U	
198-55-0-----	Perylene	2.4	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U	
191-24-2-----	Benzo(g,h,i)perylene	2.7	U	

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lot Code:

Case No.: 52656

SAS No.:

SDG No.: 52656

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	LCS	110*	101	109						0
02	PCJ-SLP6D	96	35	105						0
03	PCJ-SLP6MS	101	43	105						0
04	PCJ-SLP6FB	100	92	103						0
05	PCJ-SLP6FBD	105	98	113						0
06	SBLK01	116*	117	114						0
07	PCJ-SLP6	103	37	112						0
08	PCJ-SLP6MSD	104	40	110						0
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S1	= Naphthalene-d8	QC LIMITS
S2	= Chrysene-d12	(21-108)
S3	= Fluorene-d10	(10-118)

QC LIMITS

(21-108)

(10-118)

(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

3C  
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 52656 SAS No.:

SDG No.: 52656

Matrix Spike - EPA Sample No.: PCJ-SLP6

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	8.6	17	88	20-150
Naphthalene	9.5	0.00	13	137	20-150
Quinoline	9.5	1.5	9.5	84	20-150
2-Methylnaphthalene	9.5	2.9	11	85	20-150
Fluorene	9.5	21	30	95	69-118
Chrysene	9.5	0.00	3.9	41	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMITS RPD	REC.
1H-Indene	9.5	17	88	0	20	20-1
Naphthalene	9.5	14	147	7	20	20-1
Quinoline	9.5	10	89	6	20	20-150
2-Methylnaphthalene	9.5	12	96	12	20	20-150
Fluorene	9.5	30	95	0	20	69-118
Chrysene	9.5	3.8	40	2	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

RPD: 0 out of 7 outside limits  
 Spike Recovery: 2 out of 14 outside limits

COMMENTS: \_\_\_\_\_

4B  
SEMOVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01
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Name: QUANTERRA DENVER	Contract:	
Case No.: 52656	SAS No.:	SDG No.: 52656
File ID: A0101317	Lab Sample ID: SBLK01	
Instrument ID: A	Date Extracted: 11/20/96	
Matrix: (soil/water) WATER	Date Analyzed: 12/06/96	
Rel: (low/med) LOW	Time Analyzed: 1058	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 LCS	52656-LCS	A0201309	12/04/96
02 PCJ-SLP6D	52656-01DU	A0401311	12/04/96
03 PCJ-SLP6MS	52656-01MS	A0501312	12/04/96
04 PCJ-SLP6FB	52656-02FB	A0701314	12/04/96
05 PCJ-SLP6FBD	52656-02FD	A0801315	12/04/96
06 PCJ-SLP6	52656-01	A0301319	12/06/96
07 PCJ-SLP6MSD	52656-01MSD	A0401320	12/06/96
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COMMENTS:

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1 of 1

FORM IV SV

OLM03.0

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 52656

SAS No.:

SDG No.: 52656

File ID (Standard): A307

Date Analyzed: 12/04/96

Instrument ID: A

Time Analyzed: 1155

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	143473	12.10	214881	14.50	64387	21.12
UPPER LIMIT	286946	12.60	429762	15.00	128774	21.62
LOWER LIMIT	71736	11.60	107440	14.00	32194	20.62
EPA SAMPLE NO.						
1 LCS	140598	12.10	208480	14.50	69410	21.11
2 PCJ-SLP6D	160785	12.09	242834	14.50	105065	21.12
3 PCJ-SLP6MS	161677	12.10	248713	14.50	102335	21.12
4 PCJ-SLP6FB	158883	12.10	241504	14.51	98442	21.13
5 PCJ-SLP6FBD	170340	12.11	253627	14.51	108046	21.13
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8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

☐ Name: QUANTERRA DENVER                      Contract:  
 Code:    Case No.: 52656                      SAS No.:                      SDG No.: 52656  
 ☐ File ID (Standard): A316                      Date Analyzed: 12/06/96  
 ☐ Instrument ID: A                              Time Analyzed: 0946

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	166382	12.13	255132	14.53	84419	21.14
UPPER LIMIT	332764	12.63	510264	15.03	168838	21.64
LOWER LIMIT	83191	11.63	127566	14.03	42210	20.64
EPA SAMPLE NO.						
1 SBLK01	145114	12.13	224165	14.53	76090	21.14
2 PCJ-SLP6	151773	12.12	250547	14.52	104303	21.12
3 PCJ-SLP6MSD	160839	12.11	251013	14.52	105694	21.13
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IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
 AREA LOWER LIMIT = - 50% of internal standard area  
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 52656 SAS No.:

SDG No.: 52656

EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01 LCS	110*	101	109						0
02 PCJ-SLP6D	96	35	105						0
03 PCJ-SLP6MS	101	43	105						0
04 PCJ-SLP6FB	100	92	103						0
05 PCJ-SLP6FBD	105	98	113						0
06 SBLK01	116*	117	114						0
07 PCJ-SLP6	103	37	112						0
08 PCJ-SLP6MSD	104	40	110						0
09									
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11									
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QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

3C  
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Ab Code:

Case No.: 52656 SAS No.:

SDG No.: 52656

Matrix Spike - EPA Sample No.: PCJ-SLP6

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	8.6	17	88	20-150
Naphthalene	9.5	0.00	13	137	20-150
Quinoline	9.5	1.5	9.5	84	20-150
2-Methylnaphthalene	9.5	2.9	11	85	20-150
Fluorene	9.5	21	30	95	69-118
Chrysene	9.5	0.00	3.9	41	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC RPD	LIMITS REC.
1H-Indene	9.5	17	88	0	20	20-150
Naphthalene	9.5	14	147	7	20	20-150
Quinoline	9.5	10	89	6	20	20-150
2-Methylnaphthalene	9.5	12	96	12	20	20-150
Fluorene	9.5	30	95	0	20	69-118
Chrysene	9.5	3.8	40	2	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

RPD: 0 out of 7 outside limits

Spike Recovery: 2 out of 14 outside limits

COMMENTS: \_\_\_\_\_

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

b Name: QUANTERRA DENVER

Contract:

b Code:

Case No.: 52656

SAS No.:

SDG No.: 52656

b File ID (Standard): A307

Date Analyzed: 12/04/96

Instrument ID: A

Time Analyzed: 1155

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	143473	12.10	214881	14.50	64387	21.12
UPPER LIMIT	286946	12.60	429762	15.00	128774	21.62
LOWER LIMIT	71736	11.60	107440	14.00	32194	20.62
EPA SAMPLE NO.						
1 LCS	140598	12.10	208480	14.50	69410	21.11
2 PCJ-SLP6D	160785	12.09	242834	14.50	105065	21.12
3 PCJ-SLP6MS	161677	12.10	248713	14.50	102335	21.12
4 PCJ-SLP6FB	158883	12.10	241504	14.51	98442	21.13
5 PCJ-SLP6FBD	170340	12.11	253627	14.51	108046	21.13
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10

IS2 (PHN) = Phenanthrene-d10

IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Nar QUANTERRA DENVER

Contract:

Code: Case No.: 52656 SAS No.: SDG No.: 52656

File ID: A0101317 Lab Sample ID: SBLK01

Instrument ID: A Date Extracted: 11/20/96

Matrix: (soil/water) WATER Date Analyzed: 12/06/96

Qual: (low/med) LOW Time Analyzed: 1058

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	LCS	52656-LCS	A0201309	12/04/96
02	PCJ-SLP6D	52656-01DU	A0401311	12/04/96
03	PCJ-SLP6MS	52656-01MS	A0501312	12/04/96
04	PCJ-SLP6FB	52656-02FB	A0701314	12/04/96
05	PCJ-SLP6FBD	52656-02FD	A0801315	12/04/96
06	PCJ-SLP6	52656-01	A0301319	12/06/96
07	PCJ-SLP6MSD	52656-01MSD	A0401320	12/06/96
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

MENTS:

\_\_\_\_\_

1 ~f 1

FORM IV SV

OLM03.0

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

**Contract:**

**Code:** Case No.: 52656 SAS No.: SDG No.: 52656

File ID (Standard): A316 Date Analyzed: 12/06/96

Instrument ID: A Time Analyzed: 0946

**IS1 (ANT)** = Acenaphthene-d10  
**IS2 (PHN)** = Phenanthrene-d10  
**IS3** = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area  
AREA LOWER LIMIT = - 50% of internal standard area  
RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
\* Values outside of QC limits.

Quanterra Incorporated  
4955 Yarrow Street  
Arvada, Colorado 80002

303 421-6611 Telephone  
303 431-7171 Fax

## CASE NARRATIVE

FOR

City of St. Louis Park

February 3, 1997

Quanterra Environmental Services

Project Number 053041

### Introduction

Six aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on December 17, 1996. The samples were logged in under Quanterra Denver's project number 053041. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

### Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1995 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

The surrogate naphthalene-d8 in client sample with lab ID 053041-002MS was recovered at 111% which is outside the 21% to 108% acceptance criteria. Naphthalene-d8 was recovered in the method blank at 114% which is outside the 21% to 108% acceptance criteria. Naphthalene-d8 was recovered within the acceptance criteria in the LCS.

Spike compounds benzo (e) pyrene and quinoline were not recovered in either the matrix spike or matrix spike duplicate samples. Spike compound fluorene is reported at 147% and 137% in the matrix spike and matrix spike duplicate samples which are outside the 69% to 118% acceptance criteria. Spike compound naphthalene is reported at 158% recovery in the matrix spike duplicate sample which is outside the 20% to 150% acceptance criteria. Benzo (e) pyrene, quinoline, fluorene and naphthalene are within acceptance limits in the LCS, therefore, a matrix effect is indicated.

This data package is in compliance with the terms and conditions of the October 1995 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By: Kurt C. III Date: 2/3/97  
Kurt C. III  
Program Manager

Reviewed By: Mark DeRiviere Date: 2/3/97

SAMPLE DESCRIPTION INFORMATION  
for  
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Received Date
053041-0001-FB	PCJ-SLP6FB-121696	AQUEOUS	16 DEC 96	17 DEC 96
053041-0001-FD	PCJ-SLP6FBD-121696	AQUEOUS	16 DEC 96	17 DEC 96
053041-0002-SA	PCJ-SLP6-121696	AQUEOUS	16 DEC 96	17 DEC 96
053041-0002-DU	PCJ-SLP6D-121696	AQUEOUS	16 DEC 96	17 DEC 96
053041-0002-MS	PCJ-SLP6MS-121696	AQUEOUS	16 DEC 96	17 DEC 96
053041-0002-SD	PCJ-SLP6MSD-121696	AQUEOUS	16 DEC 96	17 DEC 96

ANALYTICAL TEST REQUESTS  
for  
City of St. Louis Park

Page 1 of 1

Lab ID: 053041	Group Code	Analysis Description	Custom Test?
0001 - 0002	A	Polynuclear Aromatic Hydrocarbons Prep - PAH Semivolatile Organics by GC/MS, 5	N N
0001	B	Polynuclear Aromatic Hydrocarbons Prep - PAH Semivolatile Organics by GC/MS, 5	N N

Chain of Custody  
Record

QUA-4124-1

Client

City of St. Louis Park  
3752 WOODDALE AVE SO.  
ST LOUIS PARK MN 55416

**Quanter**  
Environmental  
Services

Address

City

Project Name

Contract/Purchase Order/Quote No.

Project Manager

SCOTT ANDERSON

Telephone Number (Area Code)/Fax Number

924-2557 (GL2) 924-2570

Site Contact

Lab Contact

Date

12-16-96

Lab Number

Chain Of Custody Number

72378

Page 1 of 3

Analysis (Attach list if  
more space is needed)

Special Instructions/  
Conditions of Receipt

SAME

Carrier/Waybill Number

FED EX 7828345475

Matrix

Containers &  
Preservatives

PPT PPT PPT

Sample I.D. No. and Description  
(Containers for each sample may be combined on one line)

Date

Time

Aqueous

Sed.

Soil

Uppers

H2SO4

HNO3

HCl

NaOH

ZnAc

NaOH

X

X

PPT 5

PPT 5

1P3 PCJ-SLP6FB -121696

12-16-96

X

1P0 PCJ-SLP6FB -121692

12-16-96

X

Possible Hazard Identification

Non-Hazard  Flammable

Skin Irritant

Poison B

Unknown

Sample Disposal

Return To Client

Disposal By Lab

Archive For

Months (A fee may be assessed if samples are retained  
longer than 3 months)

Turn Around Time Required

24 Hours  48 Hours  7 Days  14 Days  21 Days  Other \_\_\_\_\_

1. Relinquished By

Mark

Date

12-16-96 1430

Received By

Anthony J. Ciazzo Anthony J. Ciazzo

Date

12/17/96 11:00

2. Relinquished By

Date

Time

Received By

Anthony J. Ciazzo

Date

Time

3. Relinquished By

Date

Time

Received By

Date

Time

Comments

#: 053041

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

W

**Chain of Custody  
Record**

QUA-4124-1

Client

City of St. Louis Park  
3752 WOODDALE AVE SO.  
ST LOUIS PARK MN 55416

Address

City

Project Name

SAME

Contract/Purchase Order/Quote No.

Project Manager

Scott Anderson

Telephone Number (Area Code)/Fax Number

(612) 824-2557 924-2570

Site Contact

Lab Contact

Date

12-16-96

Lab Number

Chain Of Custody Number

75698

Page 3 of 3

Analysis (Attach list if  
more space is needed)

Special Instructions/  
Conditions of Receipt

Carrier/Waybill Number

FED EX 7828345475

Matrix

Containers &  
Preservatives

PET PAH

Sample I.D. No. and Description  
(Containers for each sample may be combined on one line)

Date  
12-16-96

Time

Aqueous

Sed.

Soil

Urnars

H2SO4

HNO3

HCl

NaOH

ZnAc

NaOH

X

X

PPT 5

PPT 5

2SA PCJ-SLPG -121696

2DUPCJ-SLPGD-121696

Possible Hazard Identification

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Sample Disposal

Return To Client

Disposal By Lab

Archive For

Months (A fee may be assessed if samples are retained  
longer than 3 months)

Turn Around Time Required

24 Hours  48 Hours  7 Days  14 Days  21 Days  Other \_\_\_\_\_

1. Relinquished By

2328

Date

12-16-96

Time

1430

2. Relinquished By

3. Relinquished By

1. Received By

Anthony J. Giacco

Date

12/17/96

Time

11:15

2. Received By

3. Received By

Date

Time

Comments

#: 053041

DISTRIBUTION:

E - Stays with the Sample; CANARY - Returned to Client with Report; PIN

py

# Chain of Custody Record

**Vanterra**  
Environmental  
Services

QUA-4124-1

Client

City of St. Louis Park  
3752 WOODDALE AVE SO.  
ST LOUIS PARK MN 55416

Address

City

Project Manager

SCOTT ANDERSON

Telephone Number (Area Code)/Fax Number

924-2557 (612) 924-2570

Site Contact

Lab Contact

Date

12-16-96

Lab Number

Chain Of Custody Number

72377

Page 2 of 3

Project Name

SAME

Contract/Purchase Order/Quote No.

Carrier/Waybill Number

FED EX 7828345475

Matrix

Containers &  
Preservatives

Analysis (Attach list if  
more space is needed)

Special Instructions/  
Conditions of Receipt

Sample I.D. No. and Description

(Containers for each sample may be combined on one line)

Date

Time

Water	Sed.	Soil	Uptake	H2SO4	HNO3	HCl	NH3	ZnAc2	NaOH	PPT PPK
X										X
	X									X

WMS PCJ-5LPGM5 - 121696

12-16-96

SSD PCJ-5LPGM5D - 121696

12-16-96

PPT 5

PPT 5

Possible Hazard Identification

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Sample Disposal

Return To Client

Disposal By Lab

Archive For

(A fee may be assessed if samples are retained  
longer than 3 months)

Turn Around Time Required

24 Hours  48 Hours  7 Days  14 Days  21 Days  Other \_\_\_\_\_

QC Requirements (Specify)

1. Relinquished By

7/27

Date

12-16-96

1. Received By

Jin Wang / Lin Anthony + Ciares

Date

12/17/96

Time

11:00

2. Relinquished By

Date

2. Received By

Date

Time

3. Relinquished By

Date

3. Received By

Date

Time

Comments

#: 053041

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - F-1st Copy

UN

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6FB

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 53041 SAS No.: SDG No.: 53041

Matrix: (soil/water) WATER Lab Sample ID: 53041-01FB

Sample wt/vol: 4120 (g/ml) ML Lab File ID: A0301478

Level: (low/med) LOW Date Received: 12/17/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 12/17/96

Concentrated Extract Volume: 0 (ml) Date Analyzed: 01/22/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	
		Q	

271-89-6-----	2,3-Benzofuran	5.0	U
496-11-7-----	2,3-Dihydroindene	2.0	
95-13-6-----	1H-Indene	1.4	
91-20-3-----	Naphthalene	8.7	
95-15-8-----	Benzo(b)thiophene	0.87	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	6.0	B
90-12-0-----	1-Methylnaphthalene	2.8	B
92-52-4-----	Biphenyl	4.2	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	1.4	B
86-73-7-----	Fluorene	1.2	B
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	6.6	B
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	1.6	B
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6FBD

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 53041 SAS No.: SDG No.: 53041

Matrix: (soil/water) WATER Lab Sample ID: 53041-01FD

Sample wt/vol: 4160 (g/ml) ML Lab File ID: A0401479

Level: (low/med) LOW Date Received: 12/17/96

% Moisture: \_\_\_\_\_ Date Extracted: 12/17/96

Concentrated Extract Volume: 0 (ml) Date Analyzed: 01/22/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.9 U
496-11-7-----	2,3-Dihydroindene	2.7
95-13-6-----	1H-Indene	1.9
91-20-3-----	Naphthalene	11
95-15-8-----	Benzo(b)thiophene	0.86 U
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	7.4 B
90-12-0-----	1-Methylnaphthalene	3.7 B
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	1.3 U
83-32-9-----	Acenaphthene	1.2 U
132-64-9-----	Dibenzofuran	1.9 B
86-73-7-----	Fluorene	1.6 B
132-65-0-----	Dibenzothiophene	1.0 U
85-01-8-----	Phenanthrene	10 B
120-12-7-----	Anthracene	1.0 U
260-94-6-----	Acridine	2.8 U
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	1.8 B
129-00-0-----	Pyrene	1.3 U
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.7 U
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6

Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 53041 SAS No.: SDG No.: 53041

Matrix: (soil/water) WATER Lab Sample ID: 53041-02

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0501480

Level: (low/med) LOW Date Received: 12/17/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 12/17/96

Concentrated Extract Volume: 0 (ml) Date Analyzed: 01/22/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) NG/L Q

271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	56	_____
95-13-6-----	1H-Indene	3.8	_____
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	9.4	_____
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	4.2	B
90-12-0-----	1-Methylnaphthalene	2.3	RE
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	26	_____
83-32-9-----	Acenaphthene	59	_____
132-64-9-----	Dibenzofuran	8.6	B
86-73-7-----	Fluorene	26	B
132-65-0-----	Dibenzothiophene	1.8	_____
85-01-8-----	Phenanthrene	15	B
120-12-7-----	Anthracene	1.5	_____
260-94-6-----	Acridine	2.8	R
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	3.9	B
129-00-0-----	Pyrene	2.4	_____
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6D

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 53041

SAS No.:

SDG No.: 53041

Matrix: (soil/water) WATER

Lab Sample ID: 53041-02DU

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: A0601481

Level: (low/med) LOW

Date Received: 12/17/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 12/17/96

Concentrated Extract Volume: 0 (ml)

Date Analyzed: 01/22/97

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	58	_____
95-13-6-----	1H-Indene	4.1	_____
91-20-3-----	Naphthalene	6.2	U
95-15-8-----	Benzo(b)thiophene	9.6	_____
91-22-5-----	Quincline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	2.4	B
90-12-0-----	1-Methylnaphthalene	1.6	RB
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	24	_____
83-32-9-----	Acenaphthene	60	_____
132-64-9-----	Dibenzofuran	8.1	B
86-73-7-----	Fluorene	25	B
132-65-0-----	Dibenzothiophene	1.8	_____
85-01-8-----	Phenanthrene	12	B
120-12-7-----	Anthracene	1.7	_____
260-94-6-----	Acridine	3.0	_____
86-74-8-----	Carbazole	1.8	U
206-44-0-----	Fluoranthene	2.3	B
129-00-0-----	Pyrene	1.7	_____
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	2.7	U
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMOVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6MS

Name: QUANTERRA DENVER

Contract:

Sample Code: Case No.: 53041 SAS No.: SDG No.: 53041

Matrix: (soil/water) WATER Lab Sample ID: 53041-02MS

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0701482

Level: (low/med) LOW Date Received: 12/17/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 12/17/96

Concentrated Extract Volume: 0 (ml) Date Analyzed: 01/22/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran	4.8 U
496-11-7-----	2,3-Dihydroindene	67
95-13-6-----	1H-Indene	13
91-20-3-----	Naphthalene	14
95-15-8-----	Benzo(b)thiophene	11
91-22-5-----	Quinoline	1.3 U
120-72-9-----	1H-Indole	2.4 U
91-57-6-----	2-Methylnaphthalene	13 B
90-12-0-----	1-Methylnaphthalene	2.2 RB
92-52-4-----	Biphenyl	4.1 U
208-96-8-----	Acenaphthylene	30
83-32-9-----	Acenaphthene	70
132-64-9-----	Dibenzofuran	10 B
86-73-7-----	Fluorene	40 B
132-65-0-----	Dibenzothiophene	2.0
85-01-8-----	Phenanthrene	16 B
120-12-7-----	Anthracene	1.8
260-94-6-----	Acridine	2.9
86-74-8-----	Carbazole	1.8 U
206-44-0-----	Fluoranthene	3.5 B
129-00-0-----	Pyrene	2.2
56-55-3-----	Benzo(a)Anthracene	2.4 U
218-01-9-----	Chrysene	2.6 J
207-08-9-----	Benzo(b)fluoranthene	2.4 U
205-08-9-----	Benzo(k)fluoranthene	2.2 U
192-97-2-----	Benzo(e)pyrene	1.8 U
50-32-8-----	Benzo(a)pyrene	2.2 U
198-55-0-----	Perylene	2.4 U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3-----	Dibenzo(a,h)anthracene	1.5 U
191-24-2-----	Benzo(g,h,i)perylene	2.7 U

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PCJ-SLP6MSD

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 53041 SAS No.: SDG No.: 53041

Matrix: (soil/water) WATER Lab Sample ID: 53041-02MSD

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0801483

Level: (low/med) LOW Date Received: 12/17/96

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 12/17/96

Concentrated Extract Volume: 0 (ml) Date Analyzed: 01/22/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
271-89-6-----	2,3-Benzofuran	4.8	U
496-11-7-----	2,3-Dihydroindene	66	
95-13-6-----	1H-Indene	13	
91-20-3-----	Naphthalene	15	
95-15-8-----	Benzo(b)thiophene	11	
91-22-5-----	Quinoline	1.3	U
120-72-9-----	1H-Indole	2.4	U
91-57-6-----	2-Methylnaphthalene	12	B
90-12-0-----	1-Methylnaphthalene	2.1	RB
92-52-4-----	Biphenyl	4.1	U
208-96-8-----	Acenaphthylene	29	
83-32-9-----	Acenaphthene	69	
132-64-9-----	Dibenzofuran	9.7	B
86-73-7-----	Fluorene	39	B
132-65-0-----	Dibenzothiophene	1.8	
85-01-8-----	Phenanthrene	13	B
120-12-7-----	Anthracene	1.5	
260-94-6-----	Acridine	2.8	U
86-74-8-----	Carbazole	1.8	J
206-44-0-----	Fluoranthene	3.0	B
129-00-0-----	Pyrene	2.0	
56-55-3-----	Benzo(a)Anthracene	2.4	U
218-01-9-----	Chrysene	3.0	
207-08-9-----	Benzo(b)fluoranthene	2.4	U
205-08-9-----	Benzo(k)fluoranthene	2.2	U
192-97-2-----	Benzo(e)pyrene	1.8	U
50-32-8-----	Benzo(a)pyrene	2.2	U
198-55-0-----	Perylene	2.4	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3-----	Dibenzo(a,h)anthracene	1.5	U
191-24-2-----	Benzo(g,h,i)perylene	2.7	U

1B  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LCS

Name: QUANTERRA DENVER

Contract:

Code: Case No.: 53041 SAS No.: SDG No.: 53041  
Matrix: (soil/water) WATER Lab Sample ID: 53041-LCS  
Sample wt/vol: 4000 (g/ml) ML Lab File ID: A0201506  
Level: (low/med) LOW Date Received: \_\_\_\_\_  
% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 12/17/96  
Concentrated Extract Volume: 0 (ml) Date Analyzed: 01/24/97  
Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
95-13-6-----	1H-Indene	9.0	
91-20-3-----	Naphthalene	13	
91-22-5-----	Quinoline	8.6	
91-57-6-----	2-Methylnaphthalene	13	
86-73-7-----	Fluorene	11	
218-01-9-----	Chrysene	7.0	
192-97-2-----	Benzo(e)pyrene	6.9	

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 53041 SAS No.:

SDG No.: 53041

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT #
01	PCJ-SLP6FB	103	78	99						0
02	PCJ-SLP6FBD	107	88	104						0
03	PCJ-SLP6	91	22	94						0
04	PCJ-SLP6D	90	31	91						0
05	PCJ-SLP6MS	111*	30	112						0
06	PCJ-SLP6MSD	106	32	108						0
07	SBLK01	114*	72	108						0
08	LCS	104	77	104						0
09										
10										
11										
12										
13										
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QC LIMITS		
S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

3C  
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Name: QUANTERRA DENVER

Contract:

Job Code:

Case No.: 53041

SAS No.:

SDG No.: 53041

Matrix Spike - EPA Sample No.: PCJ-SLP6

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	3.8	13	97	20-150
Naphthalene	9.5	0.00	14	147	20-150
Quinoline	9.5	0.00	0.00	0*	20-150
2-Methylnaphthalene	9.5	4.2	13	93	20-150
Fluorene	9.5	26	40	147*	69-118
Chrysene	9.5	0.00	2.6	27	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMTS RPD	REC.
1H-Indene	9.5	13	97	0	20	20-150
Naphthalene	9.5	15	158*	7	20	20-150
Quinoline	9.5	0.00	0*		20	20-150
2-Methylnaphthalene	9.5	12	82	12	20	20-150
Fluorene	9.5	39	137*	7	20	69-118
Chrysene	9.5	3.0	32	17	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 7 outside limits

Spike Recovery: 7 out of 14 outside limits

COMMENTS: \_\_\_\_\_

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 53041

SAS No.:

SDG No.: 53041

Lab File ID: A0101505

Lab Sample ID: SBLK01

Instrument ID: A

Date Extracted: 12/17/96

Matrix: (soil/water) WATER

Date Analyzed: 01/24/97

Level: (low/med) LOW

Time Analyzed: 1322

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	PCJ-SLP6FB	53041-01FB	A0301478	01/22/97
02	PCJ-SLP6FBD	53041-01FD	A0401479	01/22/97
03	PCJ-SLP6	53041-02	A0501480	01/22/97
04	PCJ-SLP6D	53041-02DU	A0601481	01/22/97
05	PCJ-SLP6MS	53041-02MS	A0701482	01/22/97
06	PCJ-SLP6MSD	53041-02MSD	A0801483	01/22/97
07	LCS	53041-LCS	A0201506	01/24/97
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COMMENTS:

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1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK01

Name: QUANTERRA DENVER Contract: \_\_\_\_\_  
 Lab Code: Case No.: 53041 SAS No.: SDG No.: 53041  
 Matrix: (soil/water) WATER Lab Sample ID: SBLK01  
 Sample wt/vcl: 4000 (g/ml) ML Lab File ID: A0101505  
 Level: (low/med) LOW Date Received: \_\_\_\_\_  
 % Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 12/17/96  
 Concentrated Extract Volume: 0 (ml) Date Analyzed: 01/24/97  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	NG/L	Q
271-89-6-----	2,3-Benzofuran	5.1	U	
496-11-7-----	2,3-Dihydroindene	1.4	U	
95-13-6-----	1H-Indene	0.90	U	
91-20-3-----	Naphthalene	6.5	U	
95-15-8-----	Benzo(b)thiophene	0.90	U	
91-22-5-----	Quincline	1.6	U	
120-72-9-----	1H-Indole	2.5	U	
91-57-6-----	2-Methylnaphthalene	4.1	U	
90-12-0-----	1-Methylnaphthalene	2.0	U	
92-52-4-----	Biphenyl	4.3	U	
208-96-8-----	Acenaphthylene	1.4	U	
83-32-9-----	Acenaphthene	1.3	U	
132-64-9-----	Dibenzofuran	1.9	U	
86-73-7-----	Fluorene	1.5	U	
132-65-0-----	Dibenzothiophene	1.1	U	
85-01-8-----	Phenanthrene	8.9	U	
120-12-7-----	Anthracene	1.1	U	
260-94-6-----	Acridine	2.9	U	
86-74-8-----	Carbazole	1.9	U	
206-44-0-----	Fluoranthene	2.1	U	
129-00-0-----	Pyrene	1.4	U	
56-55-3-----	Benzo(a)Anthracene	2.5	U	
218-01-9-----	Chrysene	2.8	U	
207-08-9-----	Benzo(b)fluoranthene	2.5	U	
205-08-9-----	Benzo(k)fluoranthene	2.3	U	
192-97-2-----	Benzo(e)pyrene	1.9	U	
50-32-8-----	Benzo(a)pyrene	2.3	U	
198-55-0-----	Perylene	2.5	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	2.1	U	
53-70-3-----	Dibenzo(a,h)anthracene	1.6	U	
191-24-2-----	Benzo(g,h,i)perylene	2.8	U	
1146-65-2-----	Naphthalene-d8	5.7	U	
1719-03-5-----	Chrysene-d12	3.6	U	

1C  
SEMICVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA DENVER

Contract:

SBLK01

Lab Code: Case No.: 53041 SAS No.: SDG No.: 53041

Matrix: (soil/water) WATER Lab Sample ID: SBLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: A0101505

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 12/17/96

Concentrated Extract Volume: 0 (ml) Date Analyzed: 01/24/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L	Q
	-----Fluorene-d10	5.4	

2C  
WATER SEMIVOLATILE SURROGATE RECOVERY

Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 53041

SAS No.:

SDG No.: 53041

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
.01	PCJ-SLP6FB	103	78	99						0
.02	PCJ-SLP6FBD	107	88	104						0
.03	PCJ-SLP6	91	22	94						0
.04	PCJ-SLP6D	90	31	91						0
.05	PCJ-SLP6MS	111*	30	112						0
.06	PCJ-SLP6MSD	106	32	108						0
.07	SBLK01	114*	72	108						0
.08	LCS	104	77	104						0
.09										
.10										
.11										
.12										
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.27										
.28										
.29										
.30										

QC LIMITS

S1	= Naphthalene-d8	(21-108)
S2	= Chrysene-d12	(10-118)
S3	= Fluorene-d10	(41-162)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

3C  
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 53041 SAS No.: SDG No.: 53041

Matrix Spike - EPA Sample No.: PCJ-SLP6

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC. LIMITS REC.
1H-Indene	9.5	3.8	13	97	20-150
Naphthalene	9.5	0.00	14	147	20-150
Quinoline	9.5	0.00	0.00	0*	20-150
2-Methylnaphthalene	9.5	4.2	13	93	20-150
Fluorene	9.5	26	40	147*	69-118
Chrysene	9.5	0.00	2.6	27	20-132
Benzo(e)pyrene	9.5	0.00	0.00	0*	20-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMITS RPD	REC.
1H-Indene	9.5	13	97	0	20	20-150
Naphthalene	9.5	15	158*	7	20	20-150
Quinoline	9.5	0.00	0*		20	20-150
2-Methylnaphthalene	9.5	12	82	12	20	20-150
Fluorene	9.5	39	137*	7	20	69-118
Chrysene	9.5	3.0	32	17	20	20-132
Benzo(e)pyrene	9.5	0.00	0*		20	20-150

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

RPD: 0 out of 7 outside limits

Spike Recovery: 7 out of 14 outside limits

COMMENTS: \_\_\_\_\_

4B  
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK01

Name: QUANTERRA DENVER	Contract:	
Case No.: 53041	SAS No.:	SDG No.: 53041
Lab File ID: A0101505	Lab Sample ID: SBLK01	
Instrument ID: A	Date Extracted: 12/17/96	
Matrix: (soil/water) WATER	Date Analyzed: 01/24/97	
Level: (low/med) LOW	Time Analyzed: 1322	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01 PCJ-SLP6FB	53041-01FB	A0301478	01/22/97
02 PCJ-SLP6FBD	53041-01FD	A0401479	01/22/97
03 PCJ-SLP6	53041-02	A0501480	01/22/97
04 PCJ-SLP6D	53041-02DU	A0601481	01/22/97
05 PCJ-SLP6MS	53041-02MS	A0701482	01/22/97
06 PCJ-SLP6MSD	53041-02MSD	A0801483	01/22/97
07 LCS	53041-LCS	A0201506	01/24/97
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COMMENTS:

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8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 53041

SAS No.:

SDG No.: 53041

Lab File ID (Standard): A475

Date Analyzed: 01/22/97

Instrument ID: A

Time Analyzed: 1606

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	143177	12.57	206035	15.03	92878	21.65
UPPER LIMIT	286354	13.07	412070	15.53	185756	22.15
LOWER LIMIT	71588	12.07	103018	14.53	46439	21.15
EPA SAMPLE NO.						
01 PCJ-SLP6FB	168942	12.56	269292	15.02	130289	21.63
02 PCJ-SLP6FBD	167010	12.56	251303	15.01	115315	21.63
03 PCJ-SLP6	189977	12.56	313008	15.02	154502	21.63
04 PCJ-SLP6D	185226	12.56	268688	15.02	148366	21.64
05 PCJ-SLP6MS	170207	12.56	266282	15.02	151080	21.64
06 PCJ-SLP6MSD	156262	12.56	251195	15.02	113774	21.63
07						
08						
09						
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15						
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17						
18						
19						
20						
21						
22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

8B  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Name: QUANTERRA DENVER

Contract:

b Code: Case No.: 53041 SAS No.: SDG No.: 53041

Lab File ID (Standard): A504

Date Analyzed: 01/24/97

Instrument ID: A

Time Analyzed: 1245

	IS1(ANT) AREA #	RT #	IS2(PHN) AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	152528	12.67	226784	15.15	120183	21.77
UPPER LIMIT	305056	13.17	453568	15.65	240366	22.27
LOWER LIMIT	76264	12.17	113392	14.65	60092	21.27
EPA SAMPLE NO.						
01 SBLK01	172039	12.67	260290	15.15	149616	21.76
02 LCS	182097	12.67	278880	15.15	137716	21.75
03						
04						
05						
06						
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22						

IS1 (ANT) = Acenaphthene-d10  
 IS2 (PHN) = Phenanthrene-d10  
 IS3 = Benzo(a)pyrene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.